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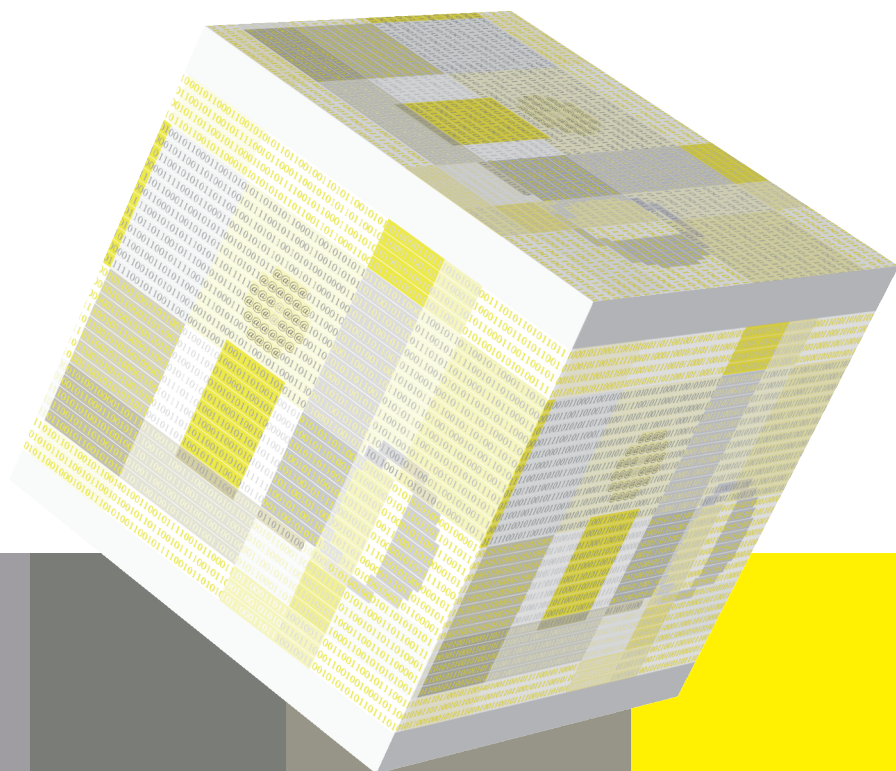
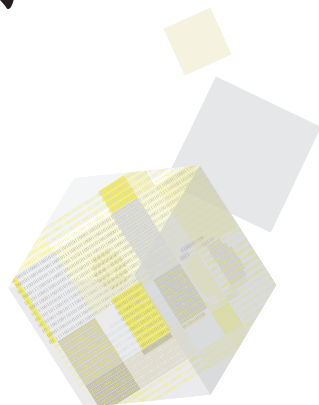
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教育資料與圖書館學，始於1970年3月創刊之教育資料科學月刊，其間於1980年9月更名為教育資料科學，並改以季刊發行。自1982年9月起易今名。另自2016年11月起，改以一年出版三期（3月、7月、11月）。現由淡江大學出版中心出版，淡江大學資訊與圖書館學系和覺生紀念圖書館合作策劃編輯。本刊為國際學術期刊，2008年獲國科會學術期刊評比為第一級，2015年獲科技部人文社會科學研究中心評定為教育學門專業類A級期刊。並廣為海內外知名資料庫所收錄(如下英文所列)。

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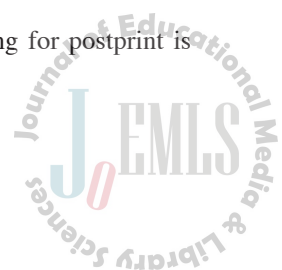
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The *JoEMLS* is an Open Access (OA) Dual, double-blind reviewed and international scholarly journal dedicated to making accessible the results of research across a wide range of Information & Library-related disciplines. The *JoEMLS* invites manuscripts for a professional information & library audience that report empirical, historical, and philosophical research with implications for librarianship or that explore theoretical and practical aspects of the field. Peer-reviewed articles are devoted to studies regarding the field of library science, information science and IT, the book trade and publishing. Subjects on instructional technology and information communication, pertaining to librarianship are also appreciated. The *JoEMLS* encourages interdisciplinary authorship because, although library science is a distinct discipline, it is in the mainstream of information science leading to the future of **InfoLibrary**.

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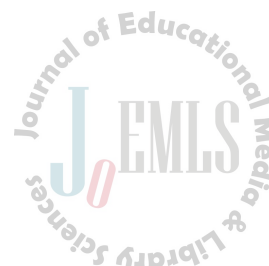
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EDITORIAL

In and Beyond This Issue

The well known founder of Faculty of 1000 (abbreviated F1000), Vitek Tracz, has been regarded as a prophet in the journal publishing field. He predicted in 2013 that peer-review journals in print will disappear within a decade, because individual academic papers have gradually become direct targets of searches and notations (such as using Digital Object Identifier). In other words, there will be no existence of “journals” as academic publications, and journal articles will be independently existing objects. These independently existing journal articles might be still attached to some journal in format, but in essence they are endowed with more space for creative publishing, and their value might be even more highlighted through the new form of open peer review system.

Our *JoEMLS* has been cooperating with Airiti company since 2004 to conduct practical analysis on the peer review system. We also worked with Airiti to design, test, and promote the mode of online submission and review system platform that met the needs of both the company and the academic field. We had completed the empowerment through technology transfer, and further realized the ideal entire-process electronic journal management system. The outcome and effectiveness of the implementation of this platform were naturally the focus of the academic publishing market in Taiwan then. Was such an electronic journal editing and incorporated platform having enough market potential and worth developing? Was the economic scale large enough to attract more business or non-business institutes for developing such a platform? These questions had a decisive impact on the popularity and quality of these products. Today, fourteen years after then, many concepts and applications are different. The concepts of Open Access, Web 2.0, Bibliometrics, and academic social media have become well-known, and the process of traditional peer-review journals has been questioned and doubted.

In the short-term future, is it feasible to apply the new form of journal submission and review platforms, such as *F1000 Research* or *PubPeer*, to the field of humanities and social science (including library and information science) journals? Will the companies of academic value-added information or database vendors be willing to participate in the development and service of this new and innovative mechanism of open peer review system? The key factor of realizing this expectation relies on the test of human nature — whether we are willing to change old habits, break through traditional limits, and accept new challenges.

In this issue (Volume 55, Issue 1), we received only 15 manuscripts, and only six of them had gone through the review process. Three of the six manuscripts were accepted, with a rejection rate of 50%. The manuscripts published in this issue include: “Faculty-Librarian Collaborative Culture and Current Development in the Colleges and Universities in Taiwan” by Ti Yu and Chao-Chen Chen, “The Reuse of Quantitative Data in Social Sciences in Taiwan: 2001-2015” by Chi-Shiou Lin and Ching-Yi Lai, and “Level of Information Literacy among Upper-Secondary School Students in Thailand and the Problems They Encounter” by Thai scholars, Chumchit Saechan and Vorasiri Siriwiwat.

With a mission of pursuing journal quality and promoting academic communication, our *Journal* has been facing the problem of manuscript insufficiency. In the future, can we rely on the new form of journal system platform for keeping innovative publishing and changing the process of journal editing and management? This is definitely a big challenge for us.

Jeong-Yeou Chiu
JoEMLS Chief Editor



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編者言

本期紀要與展望

著名的 Faculty of 1000 (F1000 系列) 創始人 Vitek Tracz 向來被視為期刊出版界先知，他於 2013 年曾斷言「同儕評閱之紙本期刊將在十年內消失殆盡」，因為學術期刊所出版的個別論文篇章漸漸成為被檢索與被標記（例如：使用 DOI）的直接對象。換言之，未來可能不復存在的是被稱作「期刊」的學術出版品；而「期刊文章」將轉換成獨立存在的個體。如此一來，這些獨立存在的期刊論文，在形式上雖可能仍依附於「某期刊」，但實質上，卻也有許多創意出版的空間，甚至藉由新型態的開放式同儕評閱（Open Peer Review）系統而更顯其價值。

本刊 教育資料與圖書館學 (JoEMLS) 於 2004 年便協同華藝數位公司進行同儕評閱系統實作分析，最後配合華藝數位公司研擬、測試、推廣合乎業者與學界需求之線上投稿暨評閱系統平台模式，並完成技術移轉授權，進而實現理想的「全程電子期刊」管理作業，此系統實施的成敗，自然也成為昔日台灣學術出版市場注目的焦點。這類電子期刊編輯整合平台是否有市場開發潛能與價值，以及是否具備一定之市場經濟規模，而足以吸引更多商業或非商業機構的開發興趣？這些問題在過去皆左右了此類產品之普及與品質。十四年後之今日，許多觀念與應用已不可同日而語，開放取用（Open Access）觀念、Web2.0、資訊計量應用、學術社群媒體等發展日漸興盛，昔日習以為常的同儕評閱（不論是人工或線上作業）傳統流程下的缺點也漸為人詬病。

在短期未來，若將 F1000 Research 或 PubPeer 之類的新興投稿暨評閱功能或平台，應用在人文社會學（含圖書資訊學）期刊領域的可行性如何？學術資訊增值廠商或資料庫商是否願意涉入「開放式同儕評閱制度」此一新形態創新機制之開發與服務？這種期待能否落實的關鍵，也往往在於人性的考驗：我們是否願意改變既有的習性，突破傳統窠臼與接受創新挑戰。

本刊期（55 卷 1 期）在收稿數量上，略顯疲弱，總計約 15 篇稿件中，最終僅順利處理完成 6 篇稿件，接受其中三篇論文，使得退稿率跌至 50%。成功刊出的論文為：于第、陳昭珍兩位的大作「台灣大學教師與館員協作文化和發展現況之研究」，而林奇秀與賴璟毅發表了「台灣社會科學量化資料再用之研究：2001-2015 年」，以及兩位泰國學者 Saechan 和 Siriwiapat 的“Level of Information Literacy among Upper-Secondary School Students in Thailand and the Problems They

Encounter”。在追求品質與學術傳播的職責下，本刊稿源的困頓持續再現，未來是否能仰仗新型態的期刊系統平台，而得以繼續創新出版、改善編輯管理流程？想必也是我們的一大挑戰。

邱 炯友
教育資料與圖書館學 主編



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台灣地區大學教師與館員 協作文化和發展現況之研究

于 第^{a*} 陳昭珍^b

摘要

本研究從文化觀點探究大學教師與館員的協作，其研究目的為：(一)發掘建構大學教師與館員協作文化概念的元素；(二)探究台灣地區大學教師和館員對大學教師與館員協作文化的評價程度；(三)檢驗大學教師和館員對大學教師與館員協作文化評價的差異性；(四)了解台灣地區大學教師與館員協作之發展現況；(五)探討大學教師與館員協作文化對二者協作發展的影響。本研究依Schein的三層次文化理論概念設計大學教師與館員調查問卷，其研究結果萃取出建構大學教師與館員協作文化的七個元素構面為：「組織的協作環境」、「協作中的相互利益與責任」、「相互了解與溝通」、「協作的承諾」、「協作的領導力」、「相互尊重與信任」，及「協作的關係與互動」。

關鍵詞：教師，館員，協作，協作文化，大學，台灣

一、前言

從過去幾十年以來，高等教育機構面臨了愈來愈多的挑戰與變化，包括資訊科技的快速發展、經費的縮減、人力的吃緊、嚴峻的評鑑，及日益遽增的競爭（如：學習成效、教學方法、研究成果、機構績效等），基於此，不少館員及教師也感受到這些問題與壓力，因而藉由彼此一起協作，以增進教師的教學和研究、學生的學習，以及推廣圖書館資源利用的成效（Casper & Lenn, 2000; Raspa & Ward, 2000; Wijayasundara, 2008）。

依研究者在大學教書及圖書館服務的經驗，由於本身曾兼具教師及館員二種角色，深感館員與教師一起協作的重要，二者協作不但可推廣圖書館的資源利用，也可提升資訊素養教育的成效；鑑此，大學教師和館員有必要考慮從各

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自孤立的框框裡走出，透過協作，一起面對上述的挑戰與問題，共同為促進教學、研究、學習、工作成效而努力。

雖然已有不少大學教師和館員開始一起協作，但還是有不少學者專家對於大學教師和館員協作的可行性提出比較保留的看法。Hardesty (1991, 1995) 認為館員少能體會教師的價值，而且也不是很了解教師文化的複雜性，因此，要讓館員跟教師一起工作有其困難度；Segal (2001) 也指出「身分地位」是影響二者協作的一個重要因素，畢竟館員不像教師是經過學術認證，有其一定的學術身分地位；Jenkins (2005) 則提到，由於多數館員未具備博士學位、學科專業背景或研究能力，因此較難獲得教師的尊重；還有，就組織上看，館員畢竟屬於「職員」層級，教師就是「教師」，所以在大部分的學校裡，二者所擁有的組織權力本來就不平等 (Christiansen, Stombler, & Thaxton, 2004)。

基於上述原因，館員與教師之間似乎確實存在著一些差距或隔閡，進而影響雙方的協作，雖然如此，過去還是有不少教師與館員願意一起協作。因此，研究者亟欲了解為何教師與館員會願意一起工作？通常二者都會採取哪些協作的方案和活動？二者協作時又會遇到那些困難？以及二者如何維持長期的協作關係？

過去二十多年，圖書館界的專家學者大多以探究教師和館員協作關係的建立，以及探討教師和館員從事的協作方案為主 (于第、黃久華，2009；查天佑、謝寶媛，2009；Doskatsch, 2003; Farber, 1999; Hardesty, 1995; Jenkins, 2005; Kraat, 2005; Raspa & Ward, 2000; Rockman, 2001; Wijayasundara, 2008)。研究者大致同意這些學者專家的觀點，但認為教師和館員的協作若要能長久持續發展，靠的應該不僅僅是關係的建立，以及一個或二個協作方案就可形成，研究者認為「文化」或許才是教師和館員能夠長期成功發展協作的關鍵。

「文化」是一個很複雜的概念，當我們將文化應用到團體或組織的層面來看的時候，文化可被視為一種社會化的過程，其影響並反映著這個團體或組織裏成員的價值觀、信仰、態度及行為 (Schein, 1992)。Mees (2008) 認為文化跟教育組織的成功有所關聯，文化扮演著形塑組織內成員行為的一個重要角色。鑑此，「協作文化」對於大學機構裡館員和教師的協作，或許應該也具有一定程度的影響。

根據過去一些的相關研究發現，大部分文獻多以探討大學教師和館員協作關係的建立，以及描述協作專案的內容為主，極少針對二者的協作文化進行探究。有鑑於此，本研究將從文化觀點去探究大學教師與館員的協作，以及發掘出能夠用來形塑和建構大學教師與館員協作文化內涵的元素。

基於上述概念和想法，研究者除了想探究建構大學教師與館員協作文化內涵的元素之外，也亟欲了解教師與館員一起協作的原因、建立協作關係的方

法、進行協作方案的模式，以及協作所遭遇的困難等現況，故本研究具體目的包括下列五大項：

- (一) 發掘能夠用來建構大學教師與館員協作文化概念的元素。
- (二) 探究台灣大學教師和館員對大學教師與館員協作文化的評價程度。
- (三) 檢驗台灣大學教師和館員對大學教師與館員協作文化評價的差異性。
- (四) 了解台灣大學教師與館員協作之發展現況，包括：教師與館員協作的原因；教師與館員建立協作關係的方法；教師與館員的協作模式；教師與館員執行協作方案的成功因素及所面臨的困難。
- (五) 探討大學教師與館員協作文化對二者協作發展的影響。

二、文獻探討

本研究依據上述研究背景與目的所提到的概念與內容，分三大部分回顧過去的相關文獻，包括：(一)大學教師與館員的協作；(二)協作文化理論；及(三)台灣地區大學教師與館員的協作案例。

(一) 大學教師與館員的協作

跟「協作」(collaboration)常被共通使用的相似意義詞彙有許多，諸如：合作(cooperation)、協調(coordination)、聯盟(coalition)、網絡(network)、結盟(alliance)、夥伴關係(partnership)及橋樑(bridge)等(Huxham, 1996)。Raspa與Ward(2000)認為，協作這個字最能代表一群人為了共同的目標、願意分擔更多的工作、以及參與大規模計畫與實作的一個較普遍且長期的關係。Wagner(1998, p. 517)定義：「協作是一個行為的過程，在這過程之中，每一個人都努力的去了解問題、願意為共同的目標進行討論並達成共識，以及分擔執行改變、評估進展和實現成果的責任。」

對於大學教師與館員的協作而言，Raspa與Ward(2000)認為其內涵應包括五個基本特性：1.熱情(passion)：館員要展現努力推動協作與協助教師教學的熱忱，相對的，教師也須展現對運用圖書館資源於教學中的興趣；2.堅持(persistence)：館員和教師需要善用每一次的機會去推動協作；3.樂於嘗試(playfulness)：不論館員或教師都要敞開心胸，樂於嘗試跟對方進行新的協作方案；4.推廣行銷(promotion)：不論館員或教師都願意向校方、各部門及校內每個人溝通並促成協作方案；以及5.計畫性(project)：協作必須以促成教師和館員願意貢獻想法、精力、時間，及技能的方案為主。Cook(2000)則強調大學教師和館員之間的協作應含三個基本成分：1.協作的目的就是要達成二者共同的目標；2.協作必須要在設計良好的架構下執行；以及3.協作就是二者相互都要得到利益。綜合以上，本研究將「大學教師與館員的協作」定義為：「一個

充滿活力、互動及互助的行為過程，在這個過程，教師和館員為完成共同的目標，一起工作、分享願景和資源，及分擔責任和任務。」

過去幾十年來，隨著時代改變的需求，館員與教師確有協作的需要，如因為資訊科技的發展或經費的緊縮，更突顯館員有必要跟教師一起協作一起推動教與學的成效 (Casper & Lenn, 2000; Jeffries, 2000)。Wijayasundara (2008) 認為因為終身教育的興起，特別是遠距教學的發達，教師更需要館員的合作，一起精進教學成效。Raspa與Ward (2000) 則認為館員普遍缺乏專業學科背景及教學經驗，所以實有需要跟教師一起協作，才能有效推動資訊素養教育。近年來，因資料皮用 (data curation) 和數據管理 (data management) 的發展趨勢，也促成了館員和教師為了推展教師的研究而一起協作 (Xia & Wang, 2014)。

為了建立並為維持二者的協作關係，愈來愈多的圖書館會設置聯絡館員 (liaison librarian)，做為跟各院或系所增進互動與溝通的重要橋樑 (Macaluso & Petruzzilli, 2005)，讓教師有機會跟館員進行個別的接觸，並提供館員能與教師洽談教學和研究協作的機會 (Carpan, 2011)。Raspa與Ward (2000) 特別強調「傾聽」及「溝通」對二者建立協作關係的重要性；Jeffries (2000) 則針對館員提出了跟教師發展良好協作關係的十項建議，包括：1. 對教師的研究有興趣；2. 表現友善；3. 對教師有禮貌並表達尊重；4. 積極推廣圖書館新產品、服務與館藏；5. 成為一位提供個人化服務的館員；6. 願意參與教師的會議；7. 展現承諾；8. 做一位好聽眾；9. 對學生的需要求有求必應；以及10. 博學的。Biggs (1981) 和 Hardesty (1991, 1995) 則提醒館員，一定要對教師的文化及價值觀有更深入的了解，才有可能建立良好的協作關係。

館員跟教師必須在良好的協作關係基礎上，才較有可能一起實施協作方案。依據Jeffries (2000) 的研究顯示，過去二者較常一起進行的協作模式，包括：圖書館利用指導、合作教課、準備教學資料、設計利用圖書館作業、撰寫研究計畫書、準備研究報告、舉辦工作坊、為特定課程設計網站、參與學校委員會計畫、發展圖書館館藏等。Gallegos與Wright (2000) 曾針對北美及澳洲的12項大學教師與館員的協作方案進行調查研究，發現接近60%的協作模式以圖書館利用指導及資訊素養教育為主。這項研究結果跟許多學者專家的看法不謀而合，館員跟教師一起推動圖書館利用指導或資訊素養教育確實是最為成功的協作模式 (Ellison, 2004; Farber, 1999; Ivey, 2003; Kraat, 2005)。

由文獻得知，過去確實有不少館員與教師一起推動協作方案的經驗，然而協作方案能否成功的執行完成則又是另一挑戰。Muronaga與Harada (1999) 主張成功的協作建立在一個共享的願景、共同的目標，以及一個相互尊重和信任氛圍的基礎上。Gallegos與Wright (2000) 提出協作的過程，有四個因素是成功的關鍵：首先，協作的內容必須是彼此共同關注的議題；第二，二者必須願

意且有能力一起著手規劃並執行這個協作方案；第三，一起協作的態度會被特殊的喜好所影響；第四，協作過程需要不斷的溝通與討論。前述都是談到有關影響協作成功的原因，相對的，其實協作過程也會遭遇一些阻礙或困難，讓協作難以順利實施。依據Manuel、Beck與Molloy（2005）針對21位曾經跟館員協作過的教師進行調查研究發現，接觸不多或溝通不良是造成協作失敗的主要原因；Christiansen、Stomblér與Thaxton（2004）直接指出教師與館員協作困難的原因在於根本上二者就是各自分離的，由組織面向來看，包括了實體的分離、文化差異、知識素養差距、不相等的組織權力，以及不同的工作結構等；就身分地位來看，各自具有不同的組織功能、專業學位、工作時間的安排、待遇和福利，以及在校園的社會關係等，由此可見二者協作之不易。

Wijayasundara（2008）曾提出一個代表大學教師與館員協作的概念化模式（如圖1）。這個概念化模式簡單的將影響教師與館員協作的因素彙整成三大因素為：個人特質、知識和技能、組織實情；另一方面，透過教師與館員的協作，所帶來的好處有三方面：教與學、研究、圖書館使用情形。研究者認為，在Wijayasundara的概念化模式裡，似乎缺少了「文化」這個元素對大學教師與館員協作的影響進行探討。

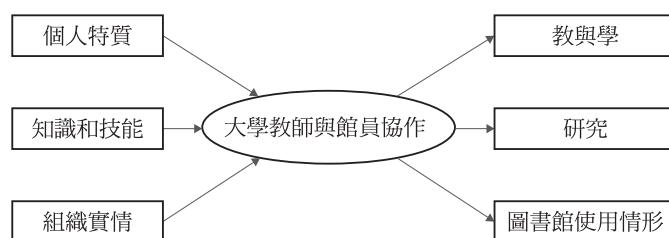


圖1 大學教師與館員協作的概念化模式

資料來源：Wijayasundara（2008, p. 194）

（二）協作文化理論

Southern（2005）定義「協作文化」乃指存在團體或組織內的共享價值觀、信仰和行為，藉以協助其成員為了一個共同的目標、程序或產品一起工作。綜觀過去文獻，實在很難找到一個特定的理論來解釋協作文化，然而大部分有提到協作文化方面的研究，其想法總跳脫不出組織文化理論的概念範疇，舉例說明如下：

1. 格魯納特的學校協作文化理論（Gruenert's School Collaborative Culture Theory）

Gruenert（1998）以學校組織為出發點來建構協作文化的內涵，透過相關的文獻分析，綜合出一組能建構學校協作文化理論的概念，包括：家長／教師／學生的關係、領導力、教師間的合作互動、教師的教學、學校的使命、外部

的支持、教師的專業發展、價值觀和信仰，以及決策機制等。基於這些概念，他設計了一個問卷，經過前測分析的結果，開發了一個包含六個構面共35個題項的問卷，用來檢測學校的協作文化。該六個構面分別為：協作領導力、教師合作、教師專業發展、目標的一致性、教師的合作互動支持，以及學習夥伴關係。

2. 羅森的協作文化論述(Rosen's Proposition for the Culture of Collaboration)

Rosen (2007) 認為組織的協作文化足以改變商業模式及組織基因，所以建議組織內的成員必須根據因為協作所產生的文化轉變而走出舒適圈，並願意改變原有的工作型態，同時也強調人們必須要了解文化是如何影響著組織內的協作。基於此概念，他提出了十種能夠成功幫助組織內成功完成協作工作的十項文化元素，包括：(1)信任；(2)分享；(3)目標；(4)創新；(5)環境；(6)允許協作時所產生一些非預期的混沌情形；(7)建設性的反對聲；(8)溝通；(9)社群；(10)價值觀。

3. 席爾的組織協作文化理論(Schill's Organizational Collaborative Culture Theory)

Schill (2014) 以職場考量角度，提出一個組織協作文化理論(The Theory of Organizational Collaborative Culture)，透過研究資料分析，她探究出能代表組織協作文化的價值、態度、行為及環境，並能影響和形塑組織協作文化的三大成分(價值、環境、現況)和15個因素(卓越度、獨立性、工作進展、組織授權、幽默感、領導力、和諧性、透明度、率直、信任、誠實、正直、真實、承諾及尊重)。Schill運用這三大成分的15個因素的概念，發展設計出一個包含45個題項名為「組織協作文化調查」(Organization Collaborative Culture Survey)的問卷，用來測量組織內員工的協作文化程度，藉以改善組織的協作文化，以及做為決定雇用員工的參考。

4. 思瑞瓦塔瓦和巴納吉的協作文化理論(Srivastava and Banaji's Collaborative Culture Theory)

Srivastava與Banaji (2011) 提出借用Schein (1992) 的三層次組織文化理論來描述協作文化的概念(如圖2)。他們認為透過Schein的「表徵」、「價值觀」及「基本假設」三個文化層次，可將組織內或團體內成員的協作文化建構起來。第一個層次「表徵」，包括團體內看得見的產品，如實體環境的建築、語言、技術、產物、服裝打扮、說話態度、情緒表現、迷思、有關組織的傳說、能展現價值觀的一些規範條例、可被觀察到的儀式和典禮；第二層次「價值觀」，通常受到團體內領導者的策略、目標及哲學觀所影響；第三個層次「基本假設」，如果一些共享的基本假設被深植在一個團體內之後，這些基本假設都會不知不覺的烙印在所有成員內心，影響並改變成員們的想法、看法、態度及行為等。

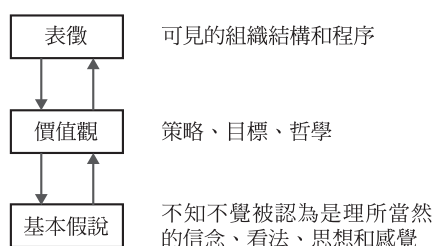


圖2 組織文化三層次

資料來源：Schein (1992, p. 17)

由上述各種協作文化理論證實，協作跟組織的協作文化有著極大的關係，並受到組織的協作文化所影響。Kozuch (2009) 曾特別強調在建構協作文化時，應了解組織的協作文化，因為如此才能讓以夥伴為基礎的協作型組織的成員知道，如何在現有組織文化的架構去行動。

(三) 台灣地區大學教師與館員的協作案例

若以大學教師和館員協作為主的研究文獻來看，近幾十年以來，不論國內或國外，絕大多數案例都是以二者一起推動資訊素養教育或圖書館利用指導為主，這樣的情形跟 Library Journal 與 Gale (2015) 針對大學教師及館員所進行的調查研究結果不謀而合。該研究發現，84% 的教師及 97% 的館員同意資訊素養教育應為圖書館提供的重要服務項目，可見由於二者對於資訊素養教育都相當重視，因而會為了推動資訊素養教育而一起協作。

在國內所發表的實證案例研究主要有三篇。第一篇是以描述景文技術學院（現名景文科技大學）圖書館館員與應用英語系 16 位教師協同推廣圖書館線上英語學習資源的實施方案內容與方式，以及訪問 564 位參與方案的學生，針對實施成效結果進行分析檢討；結果顯示，經過英文教師利用上課時間協助推廣之後，使用量均有顯著提高，且每月平均使用人次都比過去高出約十倍之多，另外在 564 位受訪學生有七成以上表示，對於利用英文課時間認識圖書館英文學習資源對其學習英語有幫助，並給予高度肯定（于第，2007）。第二篇乃以逢甲大學實施多年的資訊素養融入課程計畫為背景，針對 579 位專任教師為對象進行問卷調查，探討教師對於資訊素養融入課程的合作策略、與館員的合作態度及影響教師館員合作的因素等；研究結果顯示，個案機構的教師對協同合作抱持正面態度，此外，「館員學科知識」、「館員專業素養」、「課程策略」、「學生學習」四大因素構面對教師與館員間的合作具有影響作用（查天佑、謝寶媛，2009）。第三篇則是以介紹景文科技大學所建立的教師協同圖書館推廣館藏資源與服務機制為主，包括「融入課程教學設計」、「建置資源學科專家」、「參與資源推廣活動」、「經營部落格平台」及「連結教師評鑑制度」等五種協同推廣模式的說明；此研究依據實施後針對十位參與計畫教師所做的問卷調查分析結果，

提出五項館員與教師協作成功關鍵之建議，包括：1.與教師建立良好互動關係；2.取得高層主管重視與支持；3.建立法源明訂權利與義務；4.建立獎勵誘因機制；5.了解教師需求並持續溝通（于第、黃久華，2009）。

依據上述三篇實證研究論文內容不難發現，國內的大學教師和館員的協作方案，確實也是以協同推廣圖書館資源利用，以及合作實施資訊素養教育為主；此外，由各項計畫經過實施後的調查分析得知，二者協作對於學生的學習確實有所助益。由此可見，大學教師與館員的協作不失為因應高等教育大環境各種改變的一個有效方法，且能做為增進教師教學和研究、學生學習，以及推廣圖書館資源利用的良方。

綜合文獻分析可知，大學教師與館員協作已然成為能有效增進教師的教學和研究、學生的學習，以及推廣圖書館資源利用成效的方法。然而過去這方面主題的研究，多以探討協作方案及協作關係為主，對於「協作文化」較少著墨。有鑑於Srivastava與Banaji提出借用Schein的三層次組織文化理論來描述協作文化的概念，並考量Schein（1992）的三層次組織文化模式已是一個被企業界及學術界廣泛應用的理論，故本研究決定採用該理論做為探究與建構協作文化概念構面與因素的基礎，藉以設計發展出一個用來測量大學教師與館員協作文化評價程度的問卷工具。

三、研究方法與設計

（一）研究問題

依據上述研究目的及文獻探討所述，本研究提出五項研究問題：

1. 建構大學教師與館員協作文化概念的元素為何？
2. 台灣大學的教師和館員對大學教師與館員協作文化的評價程度為何？
3. 台灣大學教師和館員對大學教師與館員協作文化的評價程度有否差異？
4. 台灣大學教師與館員協作之發展現況為何？包括：發展教師與館員協作的原因；發展教師與館員建立協作關係的方法；執行教師與館員的協作模式；實施教師與館員協作方案的成功因素及面臨的困難等。
5. 大學教師與館員協作文化對二者的協作發展是否有所影響？

（二）理論架構

本研究參酌Srivastava和Banaji的意見，運用Schein的三層次組織文化理論做為理論架構，藉以探索出可以形塑和建構大學教師與館員協作文化概念的構面及元素。本研究透過文獻分析，以及跟曾經有過許多協作經驗的二位大學教師及二位資深館員進行一對一的訪談內容分析結果，依據「表徵」、「價值觀」及「基本假設」三個文化層次的內涵，找出了24個能代表大學教師與館員協作

文化的因素；之後，研究者再將這 24 個因素依其特性自行分成七大類別面向，並暫時命名，如表 1 所示。

表 1 建構大學教師與館員協作文化的三個文化層次、七大構面及 24 個因素之關聯分析表

文化層次	類別面向	因 素
表徵	組織協作結構	1. 型式化的系統 2. 權力差距
	協作環境	3. 實體的環境 4. 社群內協作氣氛 5. 機構的承諾
價值觀	協作領導	6. 領導者信仰及行為
基本假設	溝通	7. 人際接觸及互動 8. 傾聽 9. 正式和非正式的溝通
	相互關係	10. 相互了解 11. 相互利益 12. 相互尊敬和信任
	協作基本特徵	13. 熱情 14. 堅持 15. 樂於嘗試 16. 計畫性 17. 推廣行銷 18. 共同目標 19. 分擔責任
	協作績效	20. 教師的教學績效 21. 教師的研究績效 22. 學生的學習成效 23. 圖書館的服務績效 24. 組織的績效

(三) 研究設計與方法

1. 研究對象與範圍

本研究對象以台灣地區的大學教師和館員為主，由於研究的對象遍及台灣各地的大學教師和館員，故採用 SurveyMonkey 線上問卷工具建置問卷，透過網路，以便利抽樣法及滾雪球法，盡可能的透過各種社群媒體及發送電子郵件等方式，廣邀大學教師及館員回覆問卷。

2. 研究工具

本研究設計了二份問卷做為調查工具，一份是提供教師填答的；另一份則是給館員填答的，其實二份問卷的題目意義完全相同，只是因對象不同，陳述稱呼稍有改變。例如：問卷第二部分第一題，教師問卷題目是「我經常與館員保持聯繫」；館員問卷題目則是「我經常與教師保持聯繫」。問卷主要分成三大部分，第一部分為回覆者基本資料，共七題；第二部分主要為測量大學教師和館員對協作文化的評價程度，名為「大學教師與館員協作文化問卷」(Faculty-Librarian Collaborative Culture Questionnaire, 簡稱 FLCCQ)，最初依據表 1 的七

個類別面向及24個因素設計了47個題項，並經過五位專家學者意見修正，以及透過28位館員與35位教師的前測結果，將不適宜題項刪除，最後保留38個題項；第三部分則為了解協作的發展現況而設計，包括五大題項及35個子題，還有一個開放性問題。五大題項包括：發展教師與館員協作的原因、發展教師與館員協作關係的方法、執行教師與館員的協作模式、實施教師與館員協作方案的成功及失敗因素等；至於最後的開放性問題，則是請受訪者分享其過去的協作經驗，並提出對大學教師與館員進行協作的建議與意見。其中問卷第二部分及第三部分的題項都是採Likert 5點量表形式設計，從1到5，分別代表「非常不同意」到「非常同意」。

3. 效度與信度

為提升問卷之內容效度，本研究問卷曾先邀請五位學者專家（包括二位資深圖書館主管、一位圖書館館長及二位圖書資訊學系所教授），依其意見將問卷題項增刪並做文字修訂；之後，透過28位館員及35位教師進行前測，利用因素分析法及項目分析來進行題項刪除，將因素負荷量低於0.5，以及臨界比率低於0.3的題項予以刪除。此外，依Nunnally (1978)建議，Conbach's alpha值最好大於0.7，而本問卷第二部分整體信度alpha值高達0.943；第三部分五大題項的信度alpha值分別為0.870, 0.885, 0.890, 0.938, and 0.906，表示本問卷內容題項的一致性相當良好。

4. 資料蒐集與分析方法

自2015年12月到2016年5月為止，共有279位教師及館員填覆問卷，但可能因題項太多，不少人填到一半便放棄，故有效問卷總計191份，有效問卷回收率約為68.5%。本研究使用SPSS統計軟體，進行描述性統計、t檢定、因素分析及迴歸分析等統計方法，針對問卷所蒐集到的資料進行分析。

四、結果分析與討論

(一) 受訪教師及館員基本資料分析

如表2所示，本研究受訪教師有77位（佔40.3%）；受訪館員有114位（佔59.7%）。受訪者所屬學校類別，公立約佔40%，私立約佔60%。學校屬性部分，以技職導向佔較多數，約五成，其次是教學導向（佔32.5%），研究導向（佔17.8%）相對較少。30,000人以上學生人數的學校佔最少數，僅約5%；以學生人數0-9,999的中小型學校佔較多數，約五成。所屬學校的館員人數普遍不多，1-19館員人數者佔63.4%；館員數超過100人者佔極少數，僅約3%。至於館員最常跟哪一類學科背景的教師協作，顯見是人文學科背景者最多（佔40.4%），其次是社會科學（佔28.9%），理工（佔14.9%）、醫農（佔10.5%）及藝術設計（佔5.3%）相對較少。

表2 受訪樣本結構之次數分配表 (N=191)

背 景 變 項		次數	%	
工作職位	教師	77	40.3	
	館員	114	59.7	
學校類別	公立	78	40.8	
	私立	113	59.2	
學校屬性	研究型	34	17.8	
	教學型	62	32.5	
	技職型	95	49.7	
學生人數	0-9,999	99	51.8	
	10,000-19,999	62	32.5	
	20,000-29,999	20	10.5	
	30,000 以上	10	5.2	
館員人數	1-19	121	63.4	
	20-49	34	17.8	
	50-99	30	15.7	
	100 以上	6	3.1	
參與過教師和館員協作專案之模式 (複選題)	推動圖書館利用教育或 資訊素養教育	145	75.9	
	在課堂上進行合作教學	69	36.1	
	準備教材	41	21.5	
	設計作業	15	7.9	
	撰寫研究計畫	17	8.9	
	發展圖書館館藏	51	26.7	
	辦理工作坊或研討會	70	36.6	
	辦理讀書會	44	23.0	
	建置教學網站	24	12.6	
	其他模式	7	3.7	
	從未參與過	0	0	
學科領域 (館員則是回覆最常 與哪一類學科背景 教師進行協作)	人文	教師	21	27.3
		館員	46	40.4
	理工	教師	26	33.8
		館員	17	14.9
	社會科學	教師	26	33.8
		館員	33	28.9
	藝術設計	教師	1	1.3
		館員	6	5.3
	醫農	教師	3	3.9
		館員	12	10.5

令人感到意外的是，竟然全部的受訪教師和館員均表示，都曾有參與教師和館員協作專案的經驗，其中最多的協作模式還以「推動圖書館利用教育或資訊素養教育」為主，約四分之三受訪者都曾有過此種協作經驗；其次是「辦理工作坊或研討會」及「在課堂上進行合作教學」，約36%受訪者都表示有過這二種協作模式的經驗；至於「設計作業」(約8%)及「撰寫研究計畫」(約9%)二種協作模式經驗則相對較少。另外，有七位受訪者依其經驗，分別提出了下

列幾種其他協作模式，包括：「幫忙準備指定參考書（含DVD）給同學借閱」、「主題書展示」、「帶領同學協助認識書籍」、「合作策展」、「辦理書展及寫書」、「OpenCourseWare and MOOCs」，及「合作出版」等。

在21世紀初，根據Gallegos與Wright（2000）針對北美及澳洲地區大學所進行的調查研究發現，當時有接近60%的教師和館員進行的協作專案主要以圖書館利用教育及資訊素養教育為主。時至今日，依據Library Journal與Gale（2015）合作針對大學教師及館員所進行的調查研究結果也發現，84%的教師及97%的館員同意資訊素養教育應為圖書館提供的重要服務項目。若以此研究受訪者的回覆來看，推論超過75%的台灣地區大學教師和館員曾經有過一起推動圖書館利用教育或資訊素養教育的協作經驗，由此可見，圖書館利用教育和資訊素養教育在國內外大學均受到重視，其重要性應是與日俱增的。

（二）大學教師與館員協作文化的概念元素

本研究調查問卷的第二部分「大學教師與館員協作文化問卷」共38個題項，主要設計用來測量大學教師與館員對協作文化的評價程度。上述38個題項經過因素分析，利用KMO（Kaiser-Meyer Olkin）及Bartlett's球形檢定，KMO值為0.888，根據Kaiser（1974）觀點，KMO>0.8表示很好，適合進行因素分析，遂自動萃取出七個因素構面，當然跟研究者原先規劃的七個類別面向（如表1）略有出入。前述萃取出的七個構面及題項分配如表3。七個構面的名稱則由研究者依據題項內容自行命名，分別是「構面一：組織的協作環境」、「構面二：協作中的相互利益與責任」、「構面三：相互了解與溝通」、「構面四：協作的承諾」、「構面五：協作的領導力」、「構面六：相互尊重與信任」、「構面七：協作的關係與互動」。這七個構面，也就代表著建構大學教師與館員協作文化內涵的概念元素。

（三）受訪者對大學教師與館員協作文化的評價程度

由各構面的平均值來看（如表4），受訪者對於大學教師與館員協作文化的評價程度由高到低，依序是：「構面六：相互尊重與信任」（4.27）、「構面二：協作中的相互利益與責任」（4.02）、「構面七：協作的關係與互動」（3.97）、「構面三：相互了解與溝通」（3.70）、「構面四：協作的承諾」（3.64）、「構面五：協作的領導力」（3.50）、「構面一：組織的協作環境」（3.18）。由此可見，受訪的大學教師和館員普遍彼此相互尊重與信任，也高度展現出會為彼此績效而願意分擔責任一起協作；相反的，由他（她）們的回覆也可推論，現今大學校園內教師和館員的協作環境與氛圍似乎還不夠完善，還有就是這類的協作似乎也未獲得學校學術主管或圖書館館長的支持；至於彼此的溝通與了解程度，以及對於協作的承諾部分，或許還有再努力加強的空間。

表 3 大學教師與館員協作文化問卷構面分析

題號	題 項
構面一：組織的協作環境	
31.	本校已針對教師與館員實施協作專案制訂相關政策或規定
32.	本校已訂有鼓勵教職員間協作的獎勵辦法及措施
33.	本校通常會針對教師和館員協作的成果做成紀錄
34.	本校提供教師與館員平等的機會發表意見
35.	本校提供教師與館員平等的機會參與決策過程
36.	本校經常舉辦各種正式或非正式的活動，創造教職員工間的協作機會
37.	本校支持校內各單位間的協作
38.	本校支持教職員工間各種的協作活動
構面二：協作中的相互利益與責任	
9.	我認為與教師／館員一起工作能引發我的創意及想法
10.	我認為教師和館員協作相互有益的
21.	當教師和館員一起執行協作專案時，二者的職責應劃分清楚
22.	當教師和館員一起執行協作專案時，二者應共同承擔成敗責任
23.	我認為教師和館員協作能幫助教師增進其教學績效
24.	我認為教師和館員協作能幫助學生增進其學習成效
25.	我認為教師和館員協作能幫助館員增進其工作績效
26.	我認為教師和館員協作能提升圖書館的服務績效
構面三：相互了解與溝通	
5.	我曾參加系所單位／圖書館舉辦的會議或研習活動
6.	我曾參加校內教職員工的社團活動
7.	我了解教師／館員文化（如：教師／館員的特性、信念及其所關心的事情等）
8.	我了解教師／館員的工作性質
13.	我的想法通常受到館員的重視
14.	我喜歡跟教師／館員一起工作
構面四：協作的承諾	
15.	我會主動創造跟教師／館員協作的機會
16.	我珍惜每一次跟教師／館員協作的機會
17.	我通常會主動規劃教師和館員的協作專案
18.	我會為教師和館員協作專案付出時間及精力
19.	我經常參與教師和館員的協專案
20.	我會跟教師／館員為完成一個共同的目標一起協作
構面五：協作的領導力	
27.	我的主管支持我尋求跟教師／館員協作的機會
28.	我的主管會督促我進行教師和館員的協作專案
29.	我的主管會主動對教師和館員的協作專案提出具體建議
30.	我的主管會對我和館員協作的良好表現予以讚揚
構面六：相互尊重與信任	
3.	我會尊重並聽取教師／館員的意見和建議
11.	我一向尊重教師／館員
12.	我一向信任教師／館員
構面七：協作的關係與互動	
1.	我經常與教師／館員保持聯繫
2.	我認為圖書館為各系所單位設置聯絡窗口館員有助於強化教師和館員間的協作關係
4.	我會為了推動一個協作專案主動與教師／館員溝通及討論

表4 受訪者對大學教師與館員協作文化評價程度分析 (N=191)

題 項	教師		館員		平均值
	平均數	標準差	平均數	標準差	
構面一：組織的協作環境					
31. 本校已針對教師與館員實施協作專案制訂相關政策或規定	3.05	0.93	2.77	0.98	3.18 (標準差 =0.88)
32. 本校已訂有鼓勵教職員間協作的獎勵辦法及措施	3.09	0.93	2.62	0.93	
33. 本校通常會針對教師和館員協作的成果做成紀錄	3.31	0.95	2.97	0.90	
34. 本校提供教師與館員平等機會發表意見	3.49	0.88	2.96	0.83	
35. 本校提供教師與館員平等機會參與決策過程	3.42	0.91	2.88	0.80	
36. 本校經常舉辦各種正式或非正式的活動，創造教職員工間的協作機會	3.44	0.83	3.04	0.84	
37. 本校支持校內各單位間的協作	3.78	0.88	3.53	0.72	
38. 本校支持教職員工間各種的協作活動	3.73	0.87	3.39	0.68	
構面二：協作中的相互利益與責任					
9. 我認為與教師／館員一起工作能引發我的創意及想法	3.73	0.72	3.82	0.60	4.02 (標準差 =0.64)
10. 我認為教師和館員協作相互有益的	4.18	0.66	4.18	0.65	
21. 當教師和館員一起執行協作專案時，二者職責應劃分清楚	4.03	0.69	3.95	0.65	
22. 當教師和館員一起執行協作專案時，二者應共同承擔成敗責任	3.96	0.72	4.07	0.67	
23. 我認為教師和館員協作能幫助教師增進其教學績效	3.94	0.69	4.07	0.56	
24. 我認為教師和館員協作能幫助學生增進其學習成效	4.14	0.62	4.07	0.56	
25. 我認為教師和館員協作能幫助館員增進其工作績效	3.99	0.57	3.93	0.65	
26. 我認為教師和館員協作能提升圖書館服務績效	4.19	0.65	4.11	0.63	
構面三：相互了解與溝通					
5. 我曾參加系所單位／圖書館舉辦的會議或研習活動	4.17	0.78	3.25	1.04	3.70 (標準差 =0.85)
6. 我曾參加校內教職員工的社團活動	4.09	0.81	3.55	1.01	
7. 我了解教師／館員文化(如：教師／館員的特性、信念及其所關心事情等)	3.86	0.79	3.40	0.78	
8. 我了解教師／館員的工作性質	3.95	0.79	3.61	0.72	
13. 我的想法通常受到館員的重視	4.04	0.72	3.51	0.68	
14. 我喜歡跟教師／館員一起工作	4.06	0.73	3.55	0.68	
構面四：協作的承諾					
15. 我會主動創造跟教師／館員協作的機會	3.75	0.76	3.40	0.69	3.64 (標準差 =0.73)
16. 我珍惜每次跟教師／館員協作的機會	3.99	0.79	3.89	0.61	
17. 我通常會主動規劃教師和館員協作專案	3.55	0.85	3.39	0.72	
18. 我會為教師和館員協作專案付出時間及精力	3.81	0.76	3.94	0.54	
19. 我經常參與教師和館員的協作專案	3.32	0.85	3.26	0.78	
20. 我會跟教師／館員為完成一個共同目標協作	3.81	0.83	3.74	0.62	

構面五：協作的領導力					
27. 我的主管支持我尋求跟教師／館員協作的機會	3.56	0.87	3.80	0.78	3.50 (標準差 =0.84)
28. 我的主管會督促我進行教師和館員的協作專案	3.19	0.86	3.58	0.74	
29. 我的主管會主動對教師和館員的協作專案提出具體建議	3.21	0.92	3.50	0.78	
30. 我的主管會對我和館員協作的良好表現予以讚揚	3.35	1.00	3.58	0.79	
構面六：相互尊重與信任					
3. 我會尊重並聽取教師／館員意見和建議	4.27	0.62	4.25	0.49	4.27 (標準差 =0.61)
11. 我一向尊重教師／館員	4.55	0.55	4.32	0.62	
12. 我一向信任教師／館員	4.38	0.67	3.96	0.66	
構面七：協作的關係與互動					
1. 我經常與教師／館員保持聯繫	3.69	0.85	3.69	0.78	3.97 (標準差 =0.71)
2. 我認為圖書館為各系所單位設置聯絡窗口館員有助強化教師和館員間協作關係	4.05	0.65	4.13	0.70	
4. 我會為推動協作專案主動與教師／館員溝通及討論	4.04	0.72	4.17	0.59	

進一步由各構面的各個題項平均數可發現，受訪教師和館員的看法明顯有所差異。故本研究進一步透過t檢定，來檢驗受訪教師與館員的看法是否達到統計上的顯著性差異。由表5可看出，受訪教師和館員的看法，就「構面一：組織的協作環境」、「構面三：相互了解與溝通」、「構面五：協作的領導力」、「構面六：相互尊重與信任」及「構面七：協作的關係與互動」等，均達到統計上顯著性差異。其中除了「構面五：協作的領導力」是館員的評價程度明顯高於教師之外，其餘構面都是教師明顯高於館員。由此可推論，台灣的大學教師對於跟館員一起協作的接受度似乎比館員來得高，所以在台灣推動大學教師對與館員一起協作的話，或許由教師方面著手進行推廣可能還比較容易。此外，由表5也可看出，台灣的大學館員對於「組織的協作環境」及「相互了解與溝通」二個面向的評價程度，明顯低於教師許多，可見館員對教師的了解或許還是不夠，值得思考該如何增進彼此的溝通機會，進而更了解對方。

表5 受訪者對大學教師與館員協作文化評價程度之差異分析 (N=191)

構面	教師 (平均數)	館員 (平均數)	t值	p值
1. 組織的協作環境	3.41	3.02	4.635***	0.000
2. 協作中的相互利益與責任	4.02	4.03	-1.692	0.093
3. 相互了解與溝通	4.03	3.48	5.873***	0.000
4. 協作的承諾	3.70	3.60	0.176	0.861
5. 協作的領導力	3.33	3.61	-3.946***	0.000
6. 相互尊重與信任	4.32	3.93	2.587*	0.010
7. 協作的關係與互動	4.04	3.94	-2.885**	0.004

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

(四) 大學教師與館員協作之發展現況

1. 教師與館員發展協作的原因

由表6得知，不論受訪教師或館員均表示願意跟對方協作的主要原因，乃以促進師生利用圖書館資源與服務為首要，其次是推動資訊素養教育，再次是增進學生的學習成就，足見台灣地區大學教師和館員對學生學習成效的重視。

2. 教師與館員建立協作關係的方法

除第(4)項「館員經常主動參加系所單位舉辦的集會或活動」的平均數低於4.0之外，其他各種方法均得到受訪教師與館員的高度認同，其中又以「圖書館設置聯絡館員」及「教師經常參加圖書館舉辦的研習或推廣活動」二種方法得到受訪教師和館員的較高認同度。鑑此，圖書館值得為各學院或系所設置連絡窗口，主動跟教師聯繫，多多邀請教師參加圖書館各式活動，或邀請教師共同舉辦研習等活動，藉由頻繁互動建立良好的協作關係，並創造協作的機會；此外，不論圖書館的館長、主管或上述各院系所的窗口，真的有需要多主動參加一些院系所主辦的活動，藉由這些活動機會拉近跟教師的距離，並建立關係。

3. 教師與館員的協作模式

由表6可明顯看出，「推動圖書館利用教育或資訊素養教育」是目前最多被受訪教師和館員所採用的協作模式。針對教師而言，其型態依序以「辦理工作坊或研討會」、「發展圖書館館藏」及「在課堂上合作教學」等協作模式較多；就館員來說，其型態依序則為「發展圖書館館藏」、「辦理工作坊或研討會」及「在課堂上合作教學」等協作模式。由此結果看來，受訪教師對跟館員一起辦理工作坊或研討會的接受度相當高，鑑此，館員也可由這方面的協作模式去規劃推動跟教師的協作。

4. 教師與館員協作的成功因素

受訪教師認為雙方能一起完成協作專案的前四項成功因素，依序是：「相互尊重與信任」、「有效的溝通與互動」、「足夠的資源（如經費、人力及時間等）」及「雙方都能從協作中得到好處」；至於受訪館員認為雙方能一起完成協作專案的前四項成功因素，依序是：「有效的溝通與互動」、「相互尊重與信任」、「有共同的目標」及「得到主管及校方的支持（如：建立獎勵政策）」。由此結果可看出，受訪教師和館員均認同，彼此若要成功的進行協作，最重要的還是要建立互信互重，以及良好溝通與互動的基礎。另外，可發現，受訪教師比較在意的是，是否有足夠的資源，以及能否從協作中得到好處；至於受訪館員則認為，跟教師是否有共同的目標，以及能否得到主管及校方的支持較為重要。由此結果推論，除了有良好的互信及互動基礎之外，必須要讓教師認為在資源充裕的情況下參與協作對他（她）是有利的，才較易成功的推動雙方協作專案；至於館員方面，勢必需要得到圖書館主管及校方實質的支持，似乎才較容易成功實施雙方的協作專案。

表6 台灣地區大學教師與館員協作之發展現況分析 (N=191)

題 項	教 師		館 員	
	平均數	標準差	平均數	標準差
1.為何館員與教師要協作				
(1)促進師生利用圖書館資源與服務	4.51	0.60	4.51	0.58
(2)推動資訊素養教育	4.36	0.65	4.42	0.59
(3)增進教師的教學績效	4.14	0.70	4.13	0.70
(4)增進教師的研究績效	4.06	0.75	4.09	0.75
(5)增進學生的學習成就	4.27	0.62	4.25	0.62
(6)增進學校的辦學績效	4.12	0.71	4.02	0.78
2.教師與館員如何建立協作關係				
(1)圖書館設置「聯絡館員」(liaison librarian)	4.16	0.71	4.13	0.72
(2)圖書館設置「學科館員」(subject-specialist librarian)	4.06	0.69	4.10	0.81
(3)館員定期主動與教師聯繫，以了解教師意見與需求	4.13	0.66	4.10	0.74
(4)館員經常主動參加系所單位舉辦的集會或活動	3.97	0.76	3.83	0.83
(5)教師經常參加圖書館舉辦的研習或推廣活動	4.18	0.62	4.12	0.73
3.教師與館員通常會採取那些型態的協作模式				
(1)推動圖書館利用教育或資訊素養教育	4.32	0.68	4.40	0.61
(2)在課堂上合作教學	3.91	0.85	3.87	0.76
(3)準備教材	3.84	0.83	3.45	0.78
(4)設計作業	3.74	0.83	3.30	0.80
(5)撰寫研究計畫	3.71	0.84	3.31	0.84
(6)發展圖書館館藏	4.00	0.74	3.89	0.75
(7)辦理工作坊或研討會	4.18	0.77	3.76	0.76
(8)辦理讀書會	3.99	0.79	3.68	0.86
(9)建置教學網站	3.70	0.81	3.41	0.84
4.教師與館員實施協作專案的成功因素				
(1)有共同的目標	4.19	0.71	4.33	0.60
(2)相互尊重與信任	4.38	0.63	4.36	0.63
(3)有效的溝通與互動	4.32	0.73	4.39	0.62
(4)雙方都能從協作中得到好處	4.26	0.78	4.28	0.65
(5)雙方具備能夠協助夥伴完成任務的能力	4.22	0.75	4.23	0.67
(6)足夠的資源(如經費、人力及時間等)	4.30	0.67	4.27	0.78
(7)得到主管及校方的支持(如：建立獎勵政策)	4.19	0.73	4.32	0.77
(8)教師本身具備豐富的圖書館知識和使用經驗	4.18	0.70	4.18	0.79
5.教師與館員一起進行協作專案的困難處				
(1)彼此不熟悉	3.81	0.87	4.11	0.75
(2)文化差異大	3.40	0.92	3.90	0.81
(3)雙方在學校的權力與地位不同	3.45	0.95	4.02	0.87
(4)任一方意願不高	3.71	0.92	4.21	0.80
(5)時間配合不易	3.92	0.89	4.05	0.82
(6)缺乏互惠誘因	3.77	0.86	4.09	0.83
(7)主管或校方不支持	3.61	0.95	3.77	0.99

5. 教師與館員協作的困難處

由各項困難處的平均數來看，受訪館員普遍比受訪教師認為二者進行協作的困難度較高。就受訪館員而言，難以進行協作專案的主要二大困難是：「任一方意願不高」及「彼此不熟悉」；受訪教師則認為最困難的二大因素是：「時間配合不易」及「彼此不熟悉」。由此結果發現，現今台灣的大學教師與館員間或許還是存在著彼此不熟悉的問題，再加上教師們手邊都有許多工作職責（教學、研究、服務與輔導），倘若從協作中沒有獲得任何好處，相信教師的意願一定不高，想要推動任何協作專案的機會當然也就不高。鑑此，如何突破這些困境，值得省思。

在本研究問卷的最後，特別提出了一個開放性的問題，請受訪者就其過去的協作經驗，提出對大學教師與館員進行協作的看法和建議。總共有九位受訪館員及五位受訪教師提出看法和意見。其中一位教師提到：「個人從大學時期（1970s）便與（系）圖書館保持密切合作關係，主要的原因是為了完成教授指定的讀書報告及自發性的畢業小論文寫作，且從中獲益良多。任教之後自然而然地與各階段之校圖合作，並且力圖將圖書資源利用融入教程。」由此可以推論，教師是否願意跟館員進行協作，或許跟其過往使用圖書館的經驗有著一定的關聯性，也就是說，如果過去使用圖書館曾有過愉快的體驗，或許對跟館員協作的接受度較高。至於館員回覆的部分表示，大部分跟教師的協作經驗是愉快的，但也有部分館員提出一些比較負面的看法或不愉快的經驗，如「無法上課時，直接安排由館員代課」；「他們與圖書館進行協作專案的動力不強」；「人力缺乏狀況下，主管最在意是所耗損的人力資源」；「校方對圖書館員的期許與認知並未包含教學協助，也會降低主管想投入人力的意願」等。最後，還有一位受訪館員語重心長的表示：「台灣教育單位首長、主管若不重視與了解圖書館，僅把圖書館當作一直花錢的單位，一味地刪減人力與資源，號稱研究型大學專業館員竟只有個位數，業務全靠聘雇人員苦撐，單就維持基本開館營運就已捉襟見肘，遑論還要與教師共同實施協作專案，簡直是天方夜譚。」由前述意見得知，校方與圖書館主管對圖書館的支持程度，似乎對館員跟教師協作的意願有所影響。然而現今台灣不少大專校院圖書館與資訊中心組織整併後，圖書館獲得的資源減少，再加上某些館長對圖書館的認同度、支持度不足，或許間接也都會影響到大學教師與館員協作方案的推動。

(五) 大學教師與館員協作文化對二者協作發展的影響

如圖3所示，本模式摘要表和係數表所整理的「大學教師與館員協作文化」對「協作發展」的變數解釋力 $=0.358$ ，顯著性 $P=0.000$ ；除了因素1（組織的協作環境）路徑係數 $=0.1491$ 未達統計上顯著性，其餘因素2（協作中的相互利益與責任）路徑係數 $=0.407$ （ $p<0.001$ ）、因素3（相互了解與溝通）路徑係數 $=0.129$

($p<0.05$)、因素4(協作的承諾)路徑係數= 0.137 ($p<0.01$)、因素5(協作的領導力)路徑係數= 0.148 ($p<0.05$)、因素6(相互尊重與信任)路徑係數= 0.320 ($p<0.001$)，及因素7(協作的關係與互動)路徑係數= 0.221 ($p<0.001$)等均達統計上顯著性。鑑此，本研究推論台灣地區大學教師與館員協作文化對二者的協作發展具影響力，其中又以「協作中的相互利益與責任」、「相互尊重與信任」及「協作的關係與互動」三個因素構面影響最大。

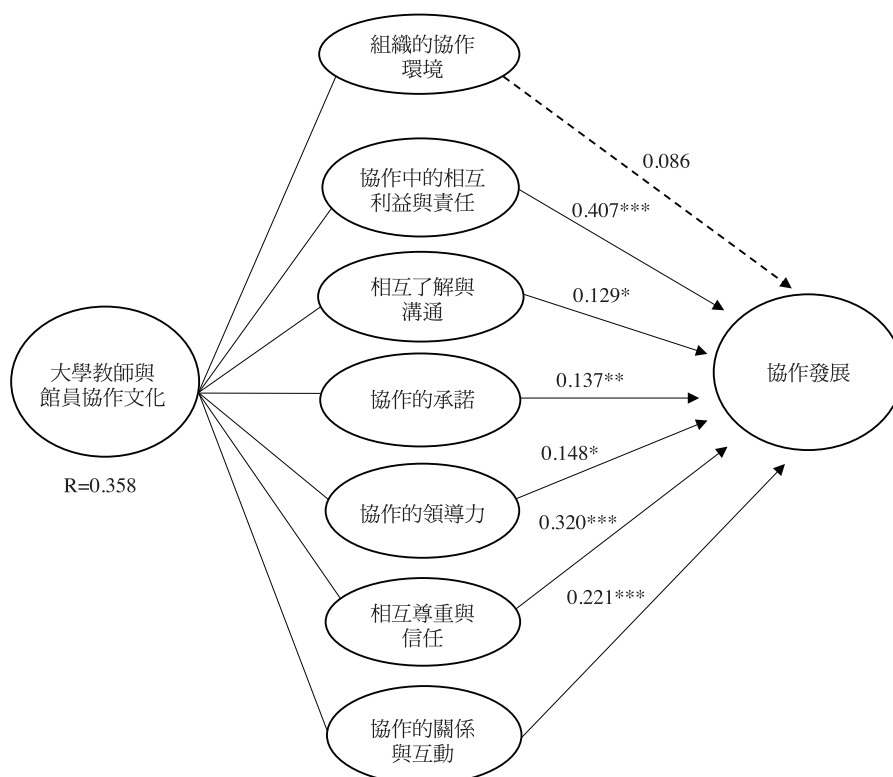


圖3 大學教師與館員協作文化對協作發展影響之迴歸分析圖

* $p<0.05$ ** $p<0.01$ *** $p<0.001$

五、結論與建議

(一) 結論

依據本研究之研究目的及所要探究之研究問題，得到下列幾項研究結論：

1. 本研究利用此次所蒐集到的資料，透過因素分析，萃取出七個能夠代表建構大學教師與館員協作文化內涵的概念元素構面，分別是「構面一：組織的協作環境」、「構面二：協作中的相互利益與責任」、「構面三：相互了解與溝通」、「構面四：協作的承諾」、「構面五：協作的領導力」、「構面六：相互尊重

與信任」、及「構面七：協作的關係與互動」。

2. 受訪的大學教師和館員普遍彼此相互尊重與信任，也高度展現出會為了彼此績效而願意分擔責任一起協作；但現今台灣的大學校園內教師和館員的協作環境與氛圍似乎不夠完善，還有就是這類的協作似乎也未獲得學校學術主管或圖書館館長的支持；至於彼此的溝通與了解程度，以及對於協作的承諾部分，或許還有再努力加強的空間。

3. 受訪的大學教師對於跟館員一起協作的接受度似乎比館員來得高，所以在台灣推動大學教師對與館員一起協作的話，或許從教師方面著手進行推廣還比較容易。此外，台灣的大學館員對於教師的了解或許還是不夠，值得思考該如何增進彼此的溝通機會，進而更了解對方。

4. 台灣地區大學教師與館員協作現況發展之情形，結論如下：

- (1) 二者協作的原因，以促進師生利用圖書館資源與服務為首要，其次是推動資訊素養教育，再其次是增進學生的學習成就。
- (2) 二者建立協作關係的方法以「圖書館設置聯絡館員」及「教師經常參加圖書館舉辦的研習或推廣活動」二種得到較多受訪教師和館員的認同。
- (3) 二者普遍最常採取的協作模式以「推動圖書館利用教育或資訊素養教育」、「辦理工作坊或研討會」、「發展圖書館館藏」及「在課堂上合作教學」等為主；「建置教學網站」、「撰寫研究計畫」及「設計作業」等協作模式相對較少被採用。
- (4) 二者協作的成功因素：受訪教師和館員均認同，彼此若要能成功的進行協作，最重要的還是要建立在互信互重，以及良好溝通與互動的基礎上才行；另外，受訪教師比較在意的是，是否有足夠的資源（如經費、人力及時間等）、以及是否能從協作中得到好處；至於受訪館員則認為，跟教師是否有共同的目標、以及是否能夠得到主管及校方的支持（如：建立獎勵政策）較為重要。
- (5) 二者協作的困難處：教師與館員之間或許還存在著彼此不熟悉的問題，再加上教師們手邊都有許多工作職責（教學、研究、服務與輔導），通常沒有多餘的時間跟館員進行協作，倘若從協作中又沒有得的任何的好處，教師的意願一定不高，那麼想要推動任何協作專案的機會當然也就不高。

5. 大學教師與館員協作文化對二者的協作發展具影響力，其中以「協作中的相互利益與責任」、「相互尊重與信任」及「協作的關係與互動」三個因素構面影響明顯較大。

(二) 建議

綜合上述研究結果和結論，研究者針對教師及館員提出一些建議：

1. 互信、互重、互惠是建立大學教師與館員協作關係與推動協作專案的基礎

由研究結果可知，「協作中的相互利益與責任」、「相互尊重與信任」及「協作的關係與互動」等三個構面是影響教師和館員協作發展的三個較重要預測因素，鑑此，館員和教師值得先建立並維持一個良好的相互尊重和信任的互動關係，接著再盡可能的找到可以創造雙贏、相互受惠的協作方案，以增進教師和館員的參與意願，如此才能形成協作共識並促成協作機會。

2. 大學教師與館員應增進彼此的溝通機會和管道

圖書館設置「聯絡館員」(liaison librarian)或「學科館員」(subject-specialist librarian)應能增進館員跟教師的溝通機會，值得各大學圖書館加以採用並積極推動。然而Donham與Green(2004)曾提醒，如果只是將聯絡館員被動的當作一個純粹的接洽人，而不是主動地去了解各院所教師對協作服務的需求，那麼就算有這樣的制度，對於建立協作關係也沒多大幫助。其實館員除了正式透過連絡館員或學科館員的名義去跟教師接觸之外，個人私下也可多跟教師打交道，成為臉書朋友或互相加LINE，再多主動參與各院系所的活動，透過非正式的私人情誼與關係，才是最好找尋協作夥伴與促成協作專案的機會和管道。另外，由受訪館員回覆得知，多數館員還是以跟人文及社會科學背景的教師協作經驗較多，相對的跟理工、醫農及藝術設計背景教師協作機會則較少，此結果提醒著大學館員們，試著針對理工、醫農及藝術設計等其他類科教師再多接觸並了解他(她)們的需求與喜好，思考突破與其溝通的方式，以期增進與其協作的機會。

3. 簡單且容易實施的協作方案是一個好的開始

「時間配合不易」是受訪教師和受訪館員進行協作專案的共同最大阻礙，如何突破這個障礙是一大難題。研究者建議可從一些簡單又容易推動的協作方案做起，如邀請教師一起舉辦小型的活動，可以是花一至二小時的演講，或半天的工作坊，可以請教師到圖書館做一個專題演講，或請教推薦演講者，以跟圖書館合辦的名義在其課堂上或圖書館進行演講；此外，也可合作舉辦一些對增進學生學習成效或對教師研究、教學有幫助的小型工作坊。藉由這些小活動的愉快經驗，先建立良好的協作默契與關係，以增進彼此未來永續協作的意願。

4. 找出有意願跟館員協作的關鍵教師

由研究結果發現，其實受訪教師比起受訪館員對二者協作的接受度還來得高，可見教師對跟館員一起協作並不一定會排斥；此外，由問卷的開放性問題分析結果發現，教師是否願意跟館員進行協作，或許跟其過往使用圖書館的經驗有著一定的關聯性，也就是說，如果過去使用圖書館曾有過愉快的體驗，或許對跟館員協作的接受度較高。鑑此，館員可試著從經常造訪圖書館的教師中找到幾位不排斥且有意願跟館員一起協作的關鍵教師，依據這些教師的需求和

興趣，主動規劃可行的協作方案，若是實施成效不錯，可藉此成功經驗以吸引其他教師的參與。

5. 推動以增進學生學習成效為主的資訊素養教育協作方案

增進學習及教學成效實施資訊素養教育和圖書館利用教育，還是最受到教師及館員的青睞，所以不論教師或館員，應該都會願意花時間與精力去完成這類的協作專案。研究者建議館員可規劃並向教師提出此類的協作模式，相信成功機率一定較高。

6. 獲得校方及館長的支持是推動大學教師和館員協作的最大助力

由研究結果得知，現今大學校園內教師和館員的協作環境與氛圍似乎不夠完善，且相關的協作活動似乎也未普遍獲得校方或館長的支持。依據Schwartz (2016)針對美國學術及公共圖書館館長所進行的訪談調查研究報告結果得知，未來二十年圖書館館員最須具備的第二大技能就是「協作」(collaboration)，可見館員具備協作能力在國外已形成一股發展趨勢，故建議除了館員可主動透過正式或非正式管道向館長提出跟教師協作的提案，藉機會展現自己的協作能力之外，也在此呼籲，館長有必要帶頭支持教師與館員的協作，並積極爭取圖書館和各院系所教師的協作機會，以及說服校方建立相關的獎勵政策，以提高各院系所教師參與協作的意願。

7. 館員需要懂得行銷自己讓教師看到你(妳)

大學校園裡的館員多半是默默耕耘的一群人，很少標榜自己的貢獻與努力，或主動參與校方的任何計畫方案，通常都是被動的接受任務者為多。Elliott de Sáez (2002)曾提出，館員們要有能力行銷他們自己，才能讓圖書館變的有所不同。研究者十分同意此看法，在今天學校普遍不是非常重視圖書館的氛圍裡，應該是館員們主動站出來行銷自己的時候了，主動讓校方及各院系所教師了解你們的價值，獲得教師的尊重與信任，才有進一步協作的可能性。

(三) 研究限制

由於本研究所蒐集到的樣本多數來自技職型和教學型的大學教師，以及小型圖書館的館員，所以研究結果不一定能推論到且完全適用於其他研究型的學校，還有館員人數較多的大型圖書館。

(四) 未來進一步研究建議

由於本研究所蒐集到的資料以量化資料為主，缺乏深入的質性資料，故未來可透過跟大學教師與館員的深度訪談，藉以蒐集到更廣泛、更多教師和館員內心深處的真正想法與看法，才能更加深入了解大學教師與館員的協作現況(如協作方案的需要、遇到的困難等)，並針對二者的協作提出更為實質有意義的建言。

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Faculty-Librarian Collaborative Culture and Current Development in the Colleges and Universities in Taiwan

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Abstract

This study explored the concept of faculty-librarian collaboration from the perspective of culture. Five research purposes are proposed in this study. They are: 1. to discover the elements that can be utilized to construct the concept of faculty-librarian collaborative culture; 2. to explore the value levels of faculty-librarian collaborative culture in the colleges and universities of Taiwan; 3. to measure the differences in the value levels of faculty-librarian collaborative culture between faculty members and librarians; 4. to understand the current development of faculty-librarian collaboration in the colleges and universities of Taiwan; and 5. to examine the impact relationship between faculty-librarian collaborative culture and the current development of faculty-librarian collaboration. This study adopted Schein's three-level model of organizational culture as the conceptual structure to explore the dimensions and factors that are utilized to construct collaborative culture between librarians and faculty members and to develop a questionnaire. An online survey tool, Survey Monkey, was used to collect data via internet in this study. In order to obtain as many replies as possible, the researchers adopted the purposive sampling approach and the snowball sampling approach to actively ask colleagues, friends and friends' friends for helping to distribute the questionnaires. As a result, 279 respondents answered the online questionnaire in total from December 2015 to May 2016. However, 88 responses were highly incomplete. This resulted in 191 valid responses, for an overall valid response rate of 68.5%. This study finally explored seven key elements that can represent and construct the content and concept of faculty-librarian collaborative culture of Taiwan. The seven elements are: 1. Organizational Collaborative Environment, 2. Mutual Benefit and Responsibility in Collaboration, 3. Mutual Understanding and Communication, 4. Collaborative Commitment, 5. Collaborative Leadership, 6. Mutual Respect and Trust, and 7. Collaborative Relationship and Interaction.

Keywords: Faculty, Librarian, Collaboration, Collaborative culture, Colleges and universities, Taiwan

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SUMMARY

Over the past few decades, higher education institutions have faced various challenges and changes, such as the rapid development of information technology, cost reduction, manpower constraints, rigid evaluation, and increased competition. Due to these challenges and changes, numerous faculty and administrative staff members in higher education institutions have come to recognize the problems and stresses involved in the transformation of teaching methods, and the tasks of enhancing student learning outcomes and improving institutional performances. As a result, collaboration has gradually become a beneficial approach for employees in numerous universities to cope with these challenges and problems.

The researchers consider that ‘collaborative culture’ is probably the basis for faculty members and librarians to work together in a higher education institution, and the key to the long-term collaborative relationships and successful collaborative projects. However, few studies have mentioned the importance of collaborative culture in collaborations between faculty members and librarians, and few studies on the topic of faculty-librarian collaborative culture have been conducted by librarians or scholars in Taiwan. Therefore, this study decides to explore the concept of faculty-librarian collaboration from the perspective of culture.

Five research purposes are proposed in this study. They are: 1. to discover the elements that can be utilized to construct the concept of faculty-librarian collaborative culture; 2. to explore the value levels of faculty-librarian collaborative culture in the colleges and universities in Taiwan; 3. to measure the differences in the value levels of faculty-librarian collaborative culture between faculty members and librarians in Taiwan; 4. to understand the current development of faculty-librarian collaboration in the colleges and universities in Taiwan, including the reasons for developing faculty-librarian collaboration, methods for building faculty-librarian collaborative relationships, models for developing faculty-librarian collaboration, success factors and difficulties faced by faculty members and librarians to conduct collaborative projects; and 5. to examine the impact relationship between faculty-librarian collaborative culture and the current development of faculty-librarian collaboration.

This study adopted Schein’s three-level model of organizational culture as the conceptual structure to explore the dimensions and factors that are utilized to construct collaborative culture between librarians and faculty members. For this study, two survey questionnaires entitled “Faculty-librarian Collaboration

Survey—Librarian” and “Faculty-librarian Collaboration Survey—Faculty” were designed and developed by the researchers to collect data. Basically, the questionnaire comprises three parts. The first part is demographic and background information, which includes seven question items. The second part is the Faculty-librarian Collaborative Culture Questionnaire (FLCCQ) with 38 question items. The third part is composed of five question items to explore the perceptions and/or experiences of faculty members and librarians regarding current development of faculty-librarian collaboration. Part II and III are designed in a five-point Likert-type format. Finally, an open-ended question is designed at the end of the third part to ask respondents to talk about their personal experience in faculty-librarian collaborative projects and to provide some comments and ideas.

The researchers invited two senior professional librarians and three scholars in librarianship in Taiwan to response to the questionnaires for measuring content validity. The questionnaires were revised and edited based on their opinions and comments. Next, a pilot study was conducted. 28 librarians and 35 faculty members were asked to pretest the questionnaires at several colleges and universities in Taiwan. Finally, the reliability of FLCCQ had a Cronbach’s alpha of 0.943. In addition, the reliability of Q1, Q2, Q3, Q4, and Q5 for the third part of the questionnaire had a Cronbach’s alpha of 0.870, 0.885, 0.890, and 0.906, respectively. These statistics indicated that the data were appropriate for factor analysis and construct validity for the full questionnaire reached an acceptable level.

An online survey tool, Survey Monkey, was used to collect data via internet in this study. In order to obtain as many replies as possible, the researchers adopted the purposive sampling approach and the snowball sampling approach and actively ask colleagues, friends and friends’ friends to help with distributing the questionnaires. As a result, 279 respondents answered the online questionnaire in total from December 2015 to May 2016. However, 88 responses were highly incomplete. This resulted in 191 valid responses, for an overall valid response rate of 68.5%.

A number of important findings and results are summarized as follows:

1. This study explores seven key elements that can represent the content and concept of faculty-librarian collaborative culture of Taiwan. The seven elements are: (1) Organizational Collaborative Environment, (2) Mutual Benefit and Responsibility in Collaboration, (3) Mutual Understanding and Communication, (4) Collaborative Commitment, (5) Collaborative Leadership, (6) Mutual Respect and Trust, and (7) Collaborative Relationship and Interaction.

2. It is evident that most of the responding faculty members and librarians in the colleges and universities in Taiwan highly respect and trust each other. Most of them also clearly understand what benefits they can obtain and what responsibilities they should assume in a faculty-librarian collaborative project. Nevertheless, most administrative leaders either in academic departments or libraries have not yet demonstrated strong support for their faculty and staff members to collaborate with each other. It is obvious that a collaborative atmosphere and environment between faculty members and librarians probably has not yet been formally built up in most of the respondents' institutions in Taiwan currently.

3. The responding faculty members demonstrates a higher level of motivation and commitment than the responding librarians in performing faculty-librarian collaborative projects. In addition, the responding librarians exhibited a lower level of familiarity with faculty members. Therefore, how to develop a better understanding with faculty members seems to be a critical issue for librarians in the colleges and universities in Taiwan to deal with currently.

4. The collaborative models of 'Promoting library use and/or information literacy', 'organizing a workshop or seminar', 'Developing the library collection', and 'Co-teaching in a class' are more frequently adopted by the responding faculty members and librarians in Taiwan. In addition, 'The library establishes a liaison librarian program' and 'Faculty members frequently take part in the library's seminars or promotion activities' are the most prevalent two methods adopted by the responding faculty members and librarians to build up their collaborative relationship. The highest level of difficulty for the responding faculty to work together in the collaborative projects is 'Not having enough time to work together' and 'Unfamiliar with each other.'

5. This study finds that the levels of faculty-librarian collaborative culture valued by the responding faculty members and librarians in the dimensions of 'Mutual Benefit and Responsibility in Collaboration', 'Mutual Respect and Trust', and 'Collaborative Relationship and Interaction' have a significantly higher impact on their experiences/perceptions toward the current development of faculty-librarian collaboration.

Finally, some practical implications and suggestions are proposed by the researchers based on the findings and results of this study for the future development of faculty-librarian collaboration. They are: (1) Mutual respect, mutual trust, and mutual benefit are the basis for librarians and faculty members to build their collaborative relationships upon; (2) Librarians and faculty members need to improve communication channels and create more communication

opportunities for them to work with each other; (3) Conducting a simple and easy collaborative project is a good start for librarians and faculty members to initiate and join in the project; (4) Librarians may try to find key persons (faculty members) who are enthusiastically interested in working with librarians; (5) Developing student-oriented collaboration for improving teaching and learning can attract more faculty members to participate in faculty-librarian collaborative projects; (6) Both librarians and faculty members need to gain leadership support for developing faculty-librarian collaboration in institutions; and (7) Librarians need to market and promote themselves more.

ROMANIZED & TRANSLATED REFERENCE FOR ORIGINAL TEXT

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台灣社會科學量化資料 再用之研究：2001-2015年

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摘要

本文分析2001-2015年間，社會科學領域利用既有量化資料從事具原創性研究之狀況，取TSSCI 2015年收錄之經濟、政治、社會、教育與心理共五學門57種期刊，辨識出1,484篇再用論文，佔整體實徵論文17.38%，經濟與政治學門比例最高，心理則非常稀少。全部被引資料筆數共2,990筆，亦多由經濟與政治論文使用，且兩大學門論文同時使用多筆資料為常態；社會與教育論文則以使用一筆資料居多。在資料來源與資料類型上，政府機關資料及業務數據為被用大宗，但不同領域在資料來源與類型上有明顯差異；個別研究與一次性資料再用程度都很低。本文建議社會科學的資料度用服務應著力於蒐集並媒合公私部門的大規模、長期性數據資料，並建立跨政府與民間的服務機制，當可裨益資料的充分再用。

關鍵詞：資料再用，資料引用，量化資料，社會科學

一、前言

資料(data)是能夠描述事物、思想、情況、處境，與其他因素的實物、數字、文字，或符號(National Research Council, 1999)，在形式上，資料可包含數字、統計、表格、圖像、影片、地理空間測量數據等(Data Information Specialist Committee - UK, 2010, as cited in Kruse & Thestrup, 2014)。資料是科學研究的基礎，對強調實徵探究的社會科學而言，無論量化或質化研究，均須仰賴資料分析來描述現象，解釋成因，進而提出研究論述或形成理論(Sechrest & Sidani, 1995)。

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近年來資料分享(data sharing)呼聲漸高,鼓勵學者釋出一手資料,將之典藏於公開典藏庫,供他人再利用(Borgman, 2012)。科學研究資料的分享呼籲在1980年代興起,對某些特定領域如天文與生命科學而言,科學知識的突破亟需大量數據,故不同研究團隊必須群策群力,共享珍貴研究資源(Konkiel, 2013; MacMillan, 2014)。時入千禧年後,E-Science與數位基礎建設(cyberinfrastructure)的推展,不僅改變科研學術生態,也讓資料皮用(data curation)成為新顯學。資料皮用指的是在研究資料產生、使用、移轉、保存、銷毀這一系列的生命週期中,透過適當的管理程序與技術對資料進行妥善的維護,並透過數位典藏庫來永久保存(陳雪華, 2012; Data Curation Center, n.d.),皮用目的是在確保研究資料能被發現、檢索、加值,與再利用(Henderson & Knott, 2015)。

基於上述趨勢,近年來關於資料皮用與研究資料管理的文獻不少,但是對於學者運用既有資料來從事衍生分析的情況,實徵研究不多。再者,既有的資料再用研究多關注科學領域,對社會科學領域的探討相對有限。然而,社會科學學者的資料再用,其實是行之有年的研究行為。歐美國家自1960年代起,即建立多個社會科學資料典藏機構,如美國密西根大學的知名跨校資料典藏聯盟Interuniversity Consortium for Political and Social Research(ICPSR)即成立於當時。顯見社會科學的資料再用比科學領域的分享倡議發生得更早,資料典藏與共享體制的悠久歷史,也凸顯了資料再用在社會科學的普及性與重要性。

社會科學與自然應用科學在資料再用上,也存在著重要差異。首先,社會科學學者使用他人蒐集的個別研究資料來進行再分析的比例,其實不高,在社會科學領域中,大部分的再用資料是政府或科研機構釋出的大規模調查或業務統計數據(林奇秀、賴璟毅, 2017; Fear, 2013)。再者,社會科學學者所使用的資料類型也不限量化數據,還包含文本、手稿、影音紀錄與實物等質性資料,但由於這些非數據資料在採集、分析、與詮釋上,與量化數據有極大差異,且非數據資料的典藏、公開與分享條件等,與數據資料也大不相同。目前,這類質性資料是否應該分享、如何皮用、再用的分析效力為何等,都仍具相當爭議(Broom, Cheshire, & Emmison, 2009; Jeng, 2017; Kim, 2013; Van den Berg, 2005)。

目前少數可得的資料再用相關研究,多以自然科學為分析對象,分析重點大致在辨識再用論文與被引資料(cited data)的特徵。例如:再用論文的年代與數量成長狀況(Piwowar & Vision, 2013; Xia & Liu, 2013; Zhang, Vogeley, & Chen, 2011)、再用論文與被引資料的學科領域分布(Fear, 2013; Piwowar, 2008; Piwowar, Carlson, & Vision, 2011; Robinson-García, Jiménez-Contreras, & Torres-Salinas, 2016; Zhang et al., 2011)、再用論文類型(Fear, 2013)、再用論文的資

料使用量 (Piwowar & Vision, 2013; Zhang, 2011)、再用論文品質 (Piwowar & Vision, 2013; Xia & Liu, 2013)、再用論文作者國家別 (資料再用較頻繁的國家; Xia & Liu, 2013)、再用論文與被引資料的年代關係 (Piwowar & Vision, 2013)、再用資料的來源別 (Zhang, 2011) 等。

然而，上述研究都面臨到一項研究方法的侷限，亦即如何辨識資料再用論文。研究者除非逐篇閱覽論文，否則難以輕易辨識一篇論文所用資料，到底是該次研究中自行蒐集產生的，抑或援引自外部。現有的資料再用研究，多是利用各學科領域知名資料典藏庫或資料引文索引 (如 Web of Science 的 Data Citation Index)，以其資料辨識碼關鍵字串先檢出論文內文或參考書目含有該典藏庫資料者，再透過人工或自動的方式，篩除生產該筆資料的原始論文，留下合乎「再用」定義的論文來進行分析。透過這類辨識獲得的樣本固然合乎條件，但也可能會遺漏其他合乎再用定義的論文，例如作者並未適當引用資料、或被引資料根本未收藏在那些典藏庫中。換言之，當樣本侷限在特定典藏庫或資料引文索引，我們就無法完整得知各領域的資料再用程度與再用行為的學科差異。同時，對非英語系國家如台灣，學者再用的資料也不見得取自國際性資料典藏庫或引文索引，因此上述方法，也不適合用於探索台灣學界的狀況。

但相對於卷帙浩繁的國際性英文期刊，台灣的學術期刊總體規模小，反而可以採取逐篇瀏覽、人工辨識的方法來完整檢出再用論文，進而比較學科的再用情況。本研究故以 TSSCI 2015 年期刊收錄清單為基礎，選取社會、經濟、政治、教育，與心理共五大學門，分析 2001 至 2015 共 15 年間的資料再用狀況。具體而言，本文企圖回答的問題，包含：

- (一)再用論文佔前述領域論文的比例為何？成長趨勢為何？
- (二)再用論文使用資料筆數的狀況為何？成長趨勢為何？
- (三)被引資料的來源為何 (即資料的蒐集者或彙編者)？有無學科差異？
- (四)被引資料的資料類型為何？有無學科差異？

如前所述，由於質性資料型態繁複且再用狀況與量化資料差距甚大，因此，本研究僅聚焦於量化資料再用。本研究所指量化資料，係指社會科學學者為進行實徵分析而自行蒐集或援用外部來源所得的數據型資料。被學者再用的量化資料，形式上可包含從外部取得的完整、獨立存在的資料集 (dataset)，也可以是學者從數據資料庫、統計刊物，或其他文件逐項檢出、自行彙整形成的資料集。換言之，只要資料集內的原始數據不是學者透過自行調查或實驗而產生的，其分析行為就視為資料再用。社會科學研究常用的量化資料類型，包含公私部門從事各類調查所得的原始數據，以及反映各類業務活動的業務統計 (業務統計也包含主事單位對各類自然與社會現象持續監測所得的數據，例如氣象、空氣品質、交通流量、人口統計等)。此外，雖然數量不多，也仍

有社會科學學者運用前人個別研究所得數據來進行再分析(林奇秀、賴璟毅, 2017; Fear, 2013)。

本文所指的「資料再用」,必須是對既有的量化資料進行具原創性的衍生分析,而非單純在驗證前人已發表的結果是否真確。資料再用必定包含原始數據的統計運算,其目的是在驗證新的研究假設或產生新的研究發現與推論。如果學者取用數據,僅為強化或佐證論述,不涉及資料的重新運算與詮釋(如僅用統計數據來鋪陳研究背景、強化論點,與其他統計數據比較等),就僅視為一般的資訊引用,而不視為資料再用。

本文所指的「被引資料」,即再用論文中援引自外部的量化資料。一篇再用論文,可使用單筆或多筆取自外部的資料集。值得注意的是,由於各領域的寫作習慣不同,學術引文規範對於資料引用也缺乏明確規範,因此,學者所援用的資料不見得都會以引註方式標註在參考書目,因此,本研究所指的被引資料,泛指所有在論文本文曾描述的被用資料,不僅限於列名在參考書目者。

為行文方便,本文後續將以「數據庫」一詞來專指資料典藏庫(data repository),藉以與台灣中文習稱的「資料庫」(database,泛指包含各種類型文本、資訊條目,或數位媒材的儲存庫)作有效區別。必須注意的是,中國大陸用語中的「數據庫」,概念等同台灣習稱的資料庫,與本文所指的數據庫概念並不相同。

二、文獻回顧

資料再用是近年才受矚目的議題,既有實徵研究相當有限,研究目標多以描述若干特定科學領域之再用特徵、再用行為,及各種阻礙再用的問題為主,且以仰賴大規模數據之科學領域為主,如基因與天文研究,社會科學資料再用的研究很少,且僅少數初探性質化研究著眼於學科脈絡與資料再用的關連,如Chao(2012)以科學研究的「時間性」(time scale)與節奏(rhythms)分析地球科學中兩種不同類型資料(實物標本及電腦運算數據)的短期與長期再用狀況。

從樣本來源來看,既有的實徵研究多以領域內的數據庫出發,去尋求有使用數據的再用論文,繼而再分析數據再用與再用論文之關係與特徵;另有一篇是以資料引文數據庫作為樣本基礎,以下分述之。

(一)自然與應用科學的資料再用

1. 基因領域

基因領域的再用研究有三篇。Piwowar(2008)的研究問題是基因研究資料的再用情形,她以2007年PLoS中200篇含有「microarray」(即DNA微陣列研究)關鍵字的論文作為樣本,以Gene Expression Omnibus(GEO)數據庫資料及

人工辨識的方式來區辨其中哪些為初用論文（亦即生產研究資料的原始論文）及再用論文。接著，再比較再用論文與初用論文使用自行產製資料的勝算比(odds ratio)，也就是一件事出現的機率跟另一件事的機率比值，計算方式是將兩者的勝算相除。結果發現：菌類研究有最高的勝算比(2.4)，而在老鼠、細菌、病毒、植物等領域，勝算比均小於0.5。換言之，在基因研究上，菌類的DNA微陣列研究論文較常再用既有資料。

Piowar與Vision(2013)則探討有公開分享資料的初用論文能否獲得較高引用量，同時也觀察再用論文的使用狀況。在再用論文的檢索部分，他們先以主題關鍵字「gene expression microarray」(基因表現微陣列)從PubMed Central、HighWire Press及Google Scholar找到10,557篇論文，續以GEO以及ArrayExpress兩個數據庫的辨識碼關鍵字串進行比對，找出其中2,617筆有公開資料的初用論文，其後，再透過這些論文原始資料的確切識別碼去搜尋，找出曾經引註這些資料的論文，並人工刪除與初用論文作者姓名相符者，共找出4,543筆第三方再用論文(亦即再用論文與初用論文的作者全不重複)。其重要研究發現包括：(1)第三方再用論文的年代分布介於2000至2010年之間，且於2004年之後快速增長。(2)再用論文年代與資料年代差距約在3至6年之間。(3)在資料使用量上，2003至2004年的第三方再用論文多數僅使用1至2個資料集，至2005年時，最多不使用超過6個資料集，然而，到2010年時，已經有25%的論文至少使用3個以上資料集，且最高超過50個資料集。

Xia與Liu(2013)關切的是再用論文的年代分布、作者來源、發表在哪些期刊、論文品質狀況等。他們以2011年以前有使用GEO數據資料、且被收錄於PubMed的第三方再用論文為樣本，共1,211篇。其主要發現包含：(1)第三方再用論文年代分布於2003至2010年之間，年代最早者為2003年共5篇論文，之後逐年增加，至2010年該年單年已有數百篇。(2)近600筆第三方再用論文的作者來自美國，遠高於第二名的英國(近500筆)，而第三至五名的國家分別為中國、德國與日本，開發中國家幾乎都沒有再用論文。(3)在論文品質方面，這些再用論文分布在286份期刊中，但48%集中於10份生醫期刊，以兩年影響係數(2-year impact factor, IF)來觀察，全部期刊的平均IF為5左右，前十名的期刊IF均高於25，顯示第三方再用論文具有一定的品質。

2. 天文領域

天文學的資料再用研究有兩篇，均以Sloan Digital Sky Survey (SDSS)數據庫的使用為樣本基礎，但此處的資料再用狀況與基因研究不太一樣，GEO數據庫內的資料大多為個別研究所貢獻出的資料，而SDSS本身是一個大型的、組織性的天文觀測數據收集計畫，數據則公開提供給天文學界分析使用。

Zhang等(2011)分析1,453篇使用SDSS數據庫資料的論文，發現：(1)出版

於1994至2007年間的再用論文，數量有逐年增加的趨勢，如2005年有264篇論文，至2006年則大幅增長為423篇。(2)1994至2001年間，論文平均作者數量逐年增加，至高為17.77人，但於2002年起逐年減少，於2007年6月僅剩6.49人。他們認為研究團隊規模變化的原因，是因早期SDSS的主導議題都需要較大研究團隊，而近期學界關切的議題不像過往那麼龐大，因此作者人數就變少了。(3)在論文主題方面，他們分析論文題目與摘要包含的名詞關鍵詞(noun phrases)數量，藉以了解論文主題繁複程度變化，結果發現，1994至2007年之間，每篇論文名詞關鍵詞平均介於10至11個之間，惟1998年少於10個，而2007年則為12.82個。他們並援引生物多樣性公式計算論文主題差異，結果發現論文主題差異程度有逐年增加的趨勢，換言之，使用SDSS資料的論文，主題是愈來愈多元的。

Zhang (2011) 在天文學文獻資料庫NASA Astrophysics Data System (ADS) 中，以“SDSS”與“Sloan AND Survey”為關鍵字進行檢索，找出2,632筆可能有用到SDSS數據的論文，並從中隨機抽取200篇進行內容分析，其中169篇(84.5%)確實有使用SDSS資料。分析結果顯示：(1)在使用資料數方面，169篇論文總共使用了278筆資料，有98篇僅使用1筆資料，有48篇使用2筆資料，只有23篇使用3筆以上資料。(2)在資料來源方面，研究者不僅使用SDSS資料，全部辨識出47個不同資料來源，略可分為：144筆(51.9%)公開數據庫資料(含SDSS)、35筆(12.5%)僅流通於天文社群之資料、59筆(21.2%)學者自行蒐集的初次資料、38筆(13.7%)作者從先前研究累積之自有資料。

3. 其他科學領域

Piwowar等(2011)從三個不同學科數據庫的使用狀況來探討學科之間的資料再用差異，三個數據庫分別為基因領域的GEO、地球與環境科學的Pangaea、及種系發生學(phylogenetics)的TreeBASE。從這三個數據庫，各隨機抽取100筆2005年資料，尋找曾引用這些資料的再用論文。由於資料尚無標準引註方式，導致再用論文的辨識有相當難度，因此，他們用了兩個方法來尋找再用論文：首先，他們使用資料的DOI號碼，在Google Scholar中檢出含有資料DOI的論文，並人工確認為確實有資料再用；其次，他們用這300筆資料的初用論文題目，在Web of Science(WoS)中檢索其後續引文，唯300篇論文的後續引文數量眾多，且不見得都是引用其原始資料，故他們先從全部引文中抽出150篇樣本，以人工辨識其中確實為資料再用論文者，再觀察三個數據庫在這些再用論文中的比例，進而以此比例來推估三個數據庫衍生出的全部資料再用論文篇數。根據上述兩個方法，他們發現：在資料使用量上，三個資料庫被使用的程度相差懸殊，如以DOI查詢結果來看，在2005至2010年間，GEO被使用了114次，Pangaea僅有7次，TreeBASE僅4次；但如根據引文來推

估，GEO估計被使用了436次，Pangaea增加到581次，而TreeBASE僅28次，顯示種系發生學的資料再用遠低於前兩個學科。

(二) 社會科學的資料再用

Fear (2013) 的研究是在觀察社會科學領域中，學者再用個別研究產出資料的情形，不含政府或機構釋出的大規模調查或業務數據。ICPSR 有一文獻資料庫稱作 Data-Related Publications，蒐集曾引用 ICPSR 資料的文獻，在研究期間該資料庫收有 2,323 篇再用論文，而 Fear 以 2000 至 2002 年間的 273 筆個別研究資料去比對這些再用論文，辨識出有再用這些資料的論文。分析發現再用論文的特徵包含：1. 在論文類型方面，有 1,560 篇 (67.3%) 期刊論文，374 篇 (16.13%) 研究報告 (Report)，157 篇 (6.78%) 書籍。2. 有 1,325 篇 (57.04%) 論文是資料的自我再用，僅 577 篇 (24.84%) 為第三方再用，其餘 271 篇 (11.68%) 則非實徵研究，故非再用。3. 在 577 篇第三方再用論文中，有 449 篇為期刊論文，以 Scopus 分類架構進行分類後，發現排名前五名的論文主題分別為醫學類 (116 筆，25.84%)、醫學與心理類 (74 筆，16.48%)、社會科學類 (59 筆，13.14%)、醫學與社會科學類 (48 筆，10.69%)、心理學與社會科學類 (38 筆，8.46%)。4. 經多元迴歸分析發現，資料作者的聲望 (以作者的 h-index 計算)、資料處理狀態 (資料是否先經過整理)、資料作者團隊規模、資料主題是否跨領域、資料規模大小 (變數多寡與樣本大小)，以及相關文獻數 (資料作者使用該資料的出版數量；資料被二次分析的文獻數量) 等，皆對資料的再用次數有所影響。

(三) 基於資料引文的跨學科比較

Robinson-García 等 (2016) 以 Data Citation Index (DCI) 中的引用數據為基礎，分析各學科的引用狀況。DCI 是 WoS 所含資料庫之一，內容涵蓋三種型態資料記錄：資料集 (data sets)、資料論文 (data studies，亦即有使用前述 data sets 的論文，含本文所指的初用與再用論文)，以及數據庫紀錄。2013 年間，DCI 收錄 2,468,736 筆 (94.1%) 資料集紀錄、154,674 筆 (5.9%) 論文紀錄，及 90 筆數據庫紀錄，而該研究發現：1. DCI 資料紀錄的主題分布為：科學領域 2,118,855 筆 (80.76%)、社會科學 462,862 筆 (17.64%)、藝術與人文 51,444 筆 (1.96%)、工程與科技領域有 1,789 筆 (0.07%)。值得注意的是，雖然科學領域紀錄量極多，但工程科技領域卻極少，甚至比藝術與人文類低。2. 在被引狀況上，全部 2,623,528 筆紀錄條目中，有 88.1% 未被引用，總被引次數為 413,689 次。整體而言，每個資料集平均被引次數為 0.12，資料論文為 0.69，數據庫則為 36.28。3. 以學科分布來看，科學領域條目被引 319,458 次 (79.03%)，社會科學被引 72,855 次 (18.02%)，藝術與人文被引 20,460 次 (5.06%)，工程與科

技被引916次(0.23%)。4.在資料集294,091被引次數中，結晶學佔所有被引量47.4%，而結晶、生化、基因學共占被引次數86%以上。5.在資料論文122,333被引次數中，社會學佔30.8%，其次是人口學佔17%，經濟學佔14.3%。相對於資料集的引用比例，社會科學在資料論文的被引佔比較高。

三、研究方法

本研究以TSSCI所收錄之社會科學期刊為基礎，取2001至2015年共15年間發表的量化資料再用論文為樣本，以內容分析法來了解社會科學整體與分領域論文之資料再用狀況。TSSCI於2015年的收錄清單共收有105筆期刊，分布在九個學門(人類、社會、教育、心理、法律、政治、經濟、管理、區域研究與地理)、綜合類，及新興跨領域等11個類別中(科技部人文社會科學研究中心，2015)。本研究選擇社會、經濟、心理、政治以及教育等五個學門進行分析。

科技部的學門分類與一般認知的社會科學學科領域分類不完全一致，例如傳播學劃分於社會學門之下、圖資與體育學門劃在教育學門之下等，造成學門內領域殊異程度非常高。為深入觀察，本研究進一步觀察刊名、刊物的官方出版資訊，以及出刊內容等，進一步將某些學門內的期刊進行學科分類，以符合學科領域認識。具體來說，社會學門再分為社會學、社會工作(簡稱社工)、傳播學三個學科；政治學門再分成政治學與公共行政與國際關係(簡稱「公行國關」)兩個學科；教育學門分成教育學、圖書資訊學，與體育學三個學科；經濟學門分成經濟學與農業經濟(簡稱「農經」)兩個學科；心理學門下則僅維持心理學一個學科。

此外，原列於「綜合類」下的四份期刊，因與前述學門及學科主題關係非常密切，本刊故納入分析，包含人口學刊歸入社會學，教育與心理研究、測驗學刊、中華心理衛生學刊歸入心理學。經歸類後，本研究共分析57份期刊(參見附錄1)。

上述部分期刊的發刊年代晚於2001年，另有部分期刊在這15年間曾歷經刊名變遷，由於刊名變遷可能代表編輯政策或內容性質的更迭，因此，期刊如有改名者，均僅取現刊卷期作分析，更名前之舊刊論文均不納入。在清查論文時，本研究先去除非研究論文(如編者言、書評、投書評論、會議實錄等)，續而區辨研究論文中的實徵研究論文與非實徵論文(如理論辯證、現象剖析、理論模式或公式建構但未採用實徵資料印證者)，再以人工瀏覽所有實徵論文的摘要與內文特定區塊(如前言、研究方法、圖表註釋等處)，確認其所用量化數據是否援自外部或由該論文自行蒐集產出，並對再用論文逐一編號，續將每筆再用論文與被引資料特徵登錄於Microsoft Excel檔案中，以利後續統計分析，登錄項目含：

1. 每筆再用論文登錄資訊

- (1) 論文篇目資訊(含期刊卷期與出版年)。
- (2) 論文所屬學門與學科(依期刊所屬之學門及學科來判別)。
- (3) 該篇論文所引用之外部資料筆數。

2. 每筆被引資料登錄資訊

- (1) 資料辨識資訊項目：資料集題名、資料來源(如作者、彙編者、提供者等)、識別碼或定位資訊(如DOI、URL或資料所在位置之文字描述)、描述資訊(關於資料集的其他內容描述如樣本規模、變數項目、調查主題等)。
- (2) 資料來源：本研究將資料來源區分為政府機關、學術機構、民間單位，及個別研究(含個人學者或個別研究團隊)等四種。
- (3) 資料類型：本研究將資料類型區分為「業務資料」(指公私機構或科研單位在長期業務執行或持續觀測中所積累與成長的數據資料，例如政府機關的業務統計、環境監測數據、人口統計等)、「系列調查資料」(指公私機構或政府單位基於特定研究目的而定期執行的調查資料，例如社會意向調查、選舉民意調查等調查統計)，與「一次性資料」(由個別學者、研究團隊，或公私機構基於特定研究目的，在單次研究中所蒐集的資料，且可辨識出該筆資料為一次性、無持續增補之意圖)。

四、研究發現

(一) 再用論文數量比例與成長趨勢

2001-2015年間，再用論文的數量狀況詳如表1。前述57份期刊共出版有1,484篇再用論文，佔全部研究論文的11.99%，佔實徵論文的17.38%。以學門狀況來看，再用論文數量由高至低依序為經濟、政治、社會、教育，與心理學門，經濟學門佔了全部再用論文的四成(40.23%)，政治學門也佔全部再用的1/4以上(26.62%)。此外，經濟學門的實徵論文高達八成(79.6%)為再用論文；排名第二的政治學門，再用論文佔實徵論文雖不足一半，但仍達四成之高(40.79%)，顯示這兩個學門不僅是台灣社會科學領域中的資料再用大宗，學門內資料再用的現象也非常普遍，對經濟學門而言，甚至是主流的資料使用方法。

值得注意的是排名第四的教育學門，其再用論文佔實徵論文比例雖然僅比心理學門高一些(5.47%)，遠低於前三個學門，但這是因為教育學門的全體論文數量為全體學門之最。事實上，其再用論文數量實高出心理學門甚多，數量直逼社會學門，也佔全體再用論文數的15.23%。因此，如就社會科學整體來看，教育學門的資料再用是仍具相當規模的。

表1 再用論文之數量、比例，與學門／學科分布（2001-2015）

學門／學科	研究 論文數	實徵 論文數	再用 論文數 (佔整體再 用%)	佔研 究論 文%	佔實 徵論 文%	學科 數量 排名	學科 比例 排名*
整體	12,381	8,541	1,484 (100.00)	11.99	17.38		
經濟學門	1,125	750	597 (40.23)	53.07	79.60		
經濟學	764	469	395	51.70	84.22	1	1
農業經濟	361	281	202	55.96	71.89	2	2
政治學門	2,265	836	341 (26.62)	15.06	40.79		
政治學	1,216	442	187	15.38	42.31	4	4
公共行政與 國際關係	1,049	394	154	14.68	39.09	6	5
社會學門	1,690	1,045	243 (16.37)	14.38	23.25		
社會學	602	381	195	32.39	51.18	3	3
社會工作	292	208	30	10.27	14.42	9	6
傳播學	796	456	18	2.26	3.95	10	10
教育學門	5,304	4,131	226 (15.23)	4.26	5.47		
教育學	3,541	2,535	186	5.25	7.34	5	7
體育學	1,306	1,219	34	2.60	2.79	8	9
圖書資訊學	457	377	6	1.31	1.59	11	11
心理學門	1,997	1,779	77 (5.19)	3.86	4.33		
心理學	1,997	1,779	77	3.86	4.33	7	8

註：*「學科比例排名」係依學科領域內再用論文佔實徵論文之比例排序

心理學門的資料再用就非常罕見，其再用論文數量不足百篇，且佔學門實徵論文僅4.33%，比例非常低。更甚者，細觀心理學門所含期刊，有四份實與教育高度相關（中華輔導與諮商學報、教育心理學報、教育與心理研究、及測驗學刊），這四份期刊共出版了53篇再用論文，佔心理學77篇的68.83%。換言之，非屬教育相關的心理學再用論文，數量真的很低。

就學科層次來看，無論從論文數量或佔實徵論文比例來看，依序均以經濟、農經、社會、政治等四個學科為首，公行國關在數量與比例上亦居前。相對來說，社工的再用論文比例雖名列第六，但論文數量卻少，不足百篇；而教育學再用論文比例雖遠低於社工，數量排名卻名列第五。後文在分析學科層次的再用論文與被引資料特徵時，將取再用論文數量超過百篇的六大學科進行分析，故含教育，但不含社工。

圖1與圖2則顯示15年區間內，整體樣本及學門／學科領域中，再用論文佔每年實徵論文百分比的逐年分布。無論在整體樣本、學門，或六大學科內，資料再用都未見明顯的成長趨勢。尤其就整體樣本來看，再用論文每年佔比相對穩定，均維持在15%至22%之間，平均值為17%，歷年來最高值與最低值距

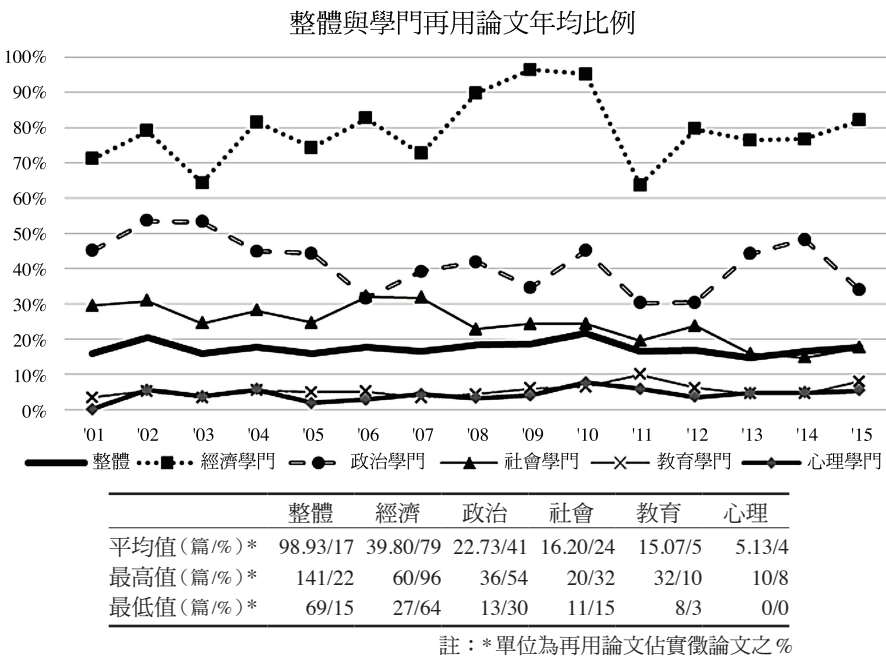


圖1 各學門再用論文比例年均分布曲線圖

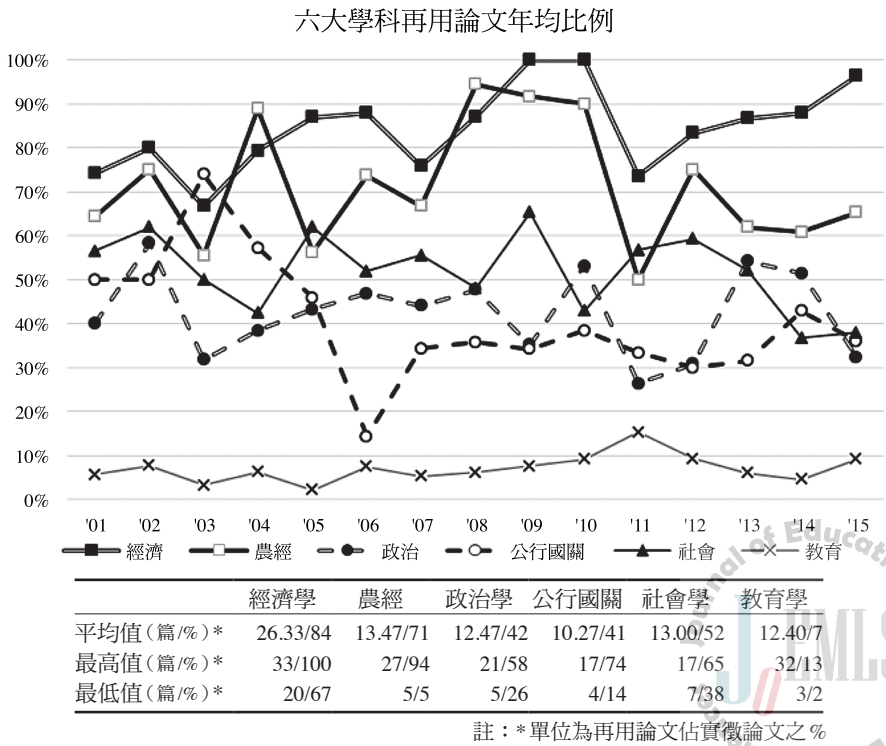


圖2 六大學科再用論文比例年均分布曲線圖

平均值約2%-5%。至於在五個學門與六大學科的年分布曲線上，經濟學門與政治學門起伏略大；在六大學科中，除教育學相對平穩，其他五個學科的起伏均大，但除經濟學有微幅上揚，其他學科並未見有明顯的上升或下降趨勢。換言之，本文所觀察的區間內，台灣社會科學領域中似無系統性驅力在強化或弱化資料再用。

(二)再用論文的資料使用量

2001-2015年間，再用論文的資料使用量狀況如表2。1,484篇再用論文共使用了2,990筆資料集，平均每篇使用2.01筆，標準差為2.02。在學門層次，以每篇論文平均使用資料多寡來看，依序是經濟、政治、社會、心理，與教育學門。經濟學門全部使用的資料筆數相當龐大，佔整體一半（50.30%），且是五個學門中唯一在資料使用筆數比例上超過再用論文數量比例的，顯見其資料再用不但普及，且每篇論文使用資料筆數量也超過其他學門。政治學門使用資料數量次於經濟，約佔整體1/4（23.21%）。整體來看，經濟與政治學門相加，即佔全部被引資料約3/4，且這兩者的平均資料使用筆數均高於整體平均值。然而，政治學門的標準差大於平均值，且是五個學門中唯一者，表示該學門論文

表2 再用論文使用資料筆數概況（2001-2015）

學門／學科	再用 論文數 (佔整體 再用%)	使用 資料數 (佔整體 資料數%)	平均值	標準差	學門 排名 (依平均值)	學科 排名 (依資料數)	學科 排名 (依平均值)
整體	1,484 (100.00)	2,990 (100.00)	2.01	2.02			
經濟學門	597 (40.23)	1,504 (50.30)	2.52	2.38	1		
經濟學	395	1,001	2.53	2.21		1	1
農業經濟	202	503	2.49	2.68		2	2
政治學門	341 (26.62)	694 (23.21)	2.04	2.11	2		
政治學	187	389	2.08	2.31		3	3
公共行政	154	305	1.98	1.85		4	5
國際關係							
社會學門	243 (16.37)	385 (12.88)	1.58	1.39	3		
社會學	195	291	1.49	1.16		5	7
社會工作	30	57	1.90	2.07		8	6
傳播學	18	37	2.06	2.07		10	4
教育學門	226 (15.23)	297 (9.93)	1.31	1.12	5		
教育學	186	243	1.31	1.20		6	10
體育學	34	45	1.32	0.68		9	11
圖書資訊學	6	9	1.50	0.84		11	7
心理學門	77 (5.19)	110 (3.68)	1.43	1.13	4		
心理學	77	110	1.43	1.13		7	9

在資料使用數量上，歧異程度甚高。

在學科部分，如果依據資料使用數量來看，六大學科正好也位居前六名，其順序為經濟、農經、政治、公行國關、社會，與教育。經濟學的使用量幾乎是排名第二的農經的兩倍（1001：503），更為排名第六的教育學的4倍有餘（1001：243），顯示了該學科在資料再用上的強度。而如以論文平均資料使用量來看，部分學科如傳播學、社工等，排名會比六大學科高，但那是因為該學科的論文篇數少，只要少量論文使用較多筆資料，就會提高學科平均使用量。如果單獨比較六大學科的平均使用量，由高至低順序正好也與數量排名相同。換言之，在學科層次上，資料使用量最高者，依序就是經濟、農經、政治、公行國關、社會，與教育。唯其中農經與政治學標準差數值較大，顯示這兩個學科在資料使用量上歧異程度也較大。

從累計百分比來觀察（參見附錄2），可發現在整體樣本中，約有六成（60.58%）的再用論文僅使用1筆資料；使用1-2筆者累計略高過整體的3/4（77.02%）；而使用1-4筆資料者，累計即超過論文九成（91.64%）。但進一步觀察五個學門時，可發現在累計分布上有明顯的差距。經濟學門中僅用1筆資料的論文低於五成（44.56%），政治學則僅逼近六成（58.06%），也就是說，在這兩個學門中，使用多筆資料的再用論文相當常見，甚至有單篇論文可同時使用20餘筆資料。相對而言，其他三個學門都以使用1筆資料為大宗，數量都佔學門論文的3/4以上（社會學最低，為75.72%，教育學門高達84.51%），換言之，在這三個學門中，使用1筆以上資料的論文都屬小眾。

而觀察六大學科累計百分比分布（參見附錄3），可發現與學科與所屬學門的分布狀況非常接近；而且，屬同一學門的學科，累計分布的趨勢也相當接近。首先，同屬經濟學門的經濟與農經，僅用1筆資料的再用論文比例都未過半（42.28%與49.01%）；而將近八成的再用論文使用資料都是介於1-3筆（77.72%與80.20%）；稍逾九成的論文使用1-5筆（92.66%與91.58%）。再來，同屬政治學門的政治與公行國關，僅用1筆資料者，均是高於五成而未達六成（57.75%與58.44%）；使用1-2筆者均佔再用論文約莫3/4（78.07%與75.32%）；而同樣的，使用1-4筆者即逾九成（90.91%與92.86%）。這個結果顯示，在經濟與政治學門中，其下屬學科的資料再用行為是相當類似的。

而社會學與教育學這兩個學科，因分別是社會學門與教育學門下的資料再用大宗，學門下的其他學科因再用論文稀少，因此，學科的分布趨勢幾乎與學門完全相當。在社會學中，僅用1筆資料者即逾再用論文的3/4（76.92%）；而教育學中僅用1筆資料者，就已超過再用論文的八成五（86.2%）。

本研究另觀察樣本整體及學門／學科層次的資料再用年均分布，目的有二：其一，觀察在近年資料分享的呼籲下，社會科學的資料再用是否有隨之增加；其二，不同學門或學科之間，資料再用是否有獨特的成長變化。圖3與圖4

分別顯示整體樣本及學門／學科領域中，15年區間內再用論文的資料使用筆數年均分布狀況。

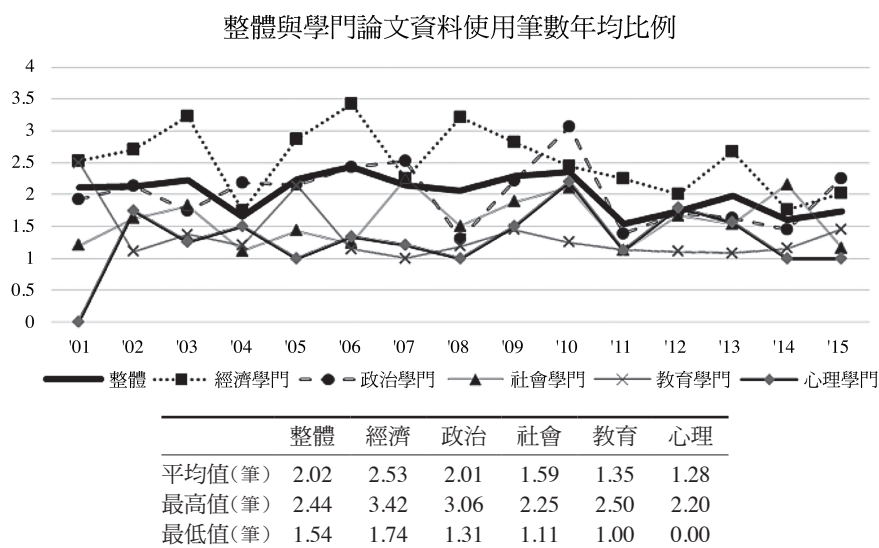


圖3 整體樣本與各學門論文資料使用量年均分布曲線圖

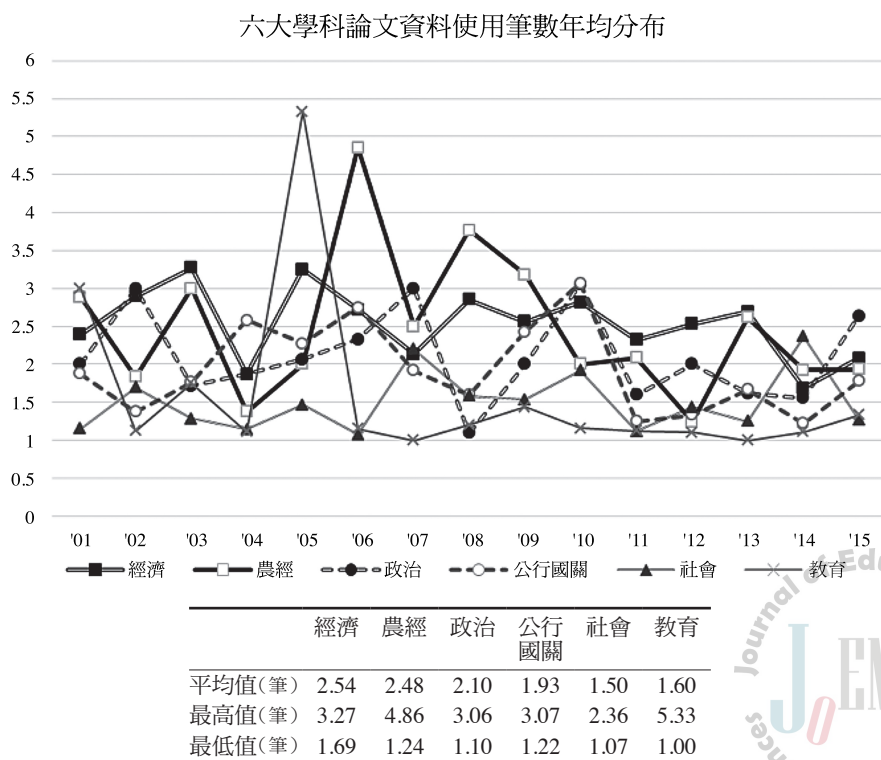


圖4 六大學科論文使用資料量年均分布曲線圖

首先，就整體而言，年均使用資料量起伏不大，最高值為2.44筆，最低值為1.54筆，與平均值相差僅0.42-0.48筆。在學門部分，15年間的年均分布或有起伏，但同樣未見有任一學門出現明顯持衡的上升或下降趨勢。六大學科的分佈亦然，若干學科如農經與教育學，曾於特定年間出現使用多筆資料的論文，因而拉高該年年均筆數，但整體來看，也無任何特定學科出現持衡的上升或下降趨勢，顯示在本研究分析的時限內，似無外在趨力在系統性地鼓勵或貶抑同篇論文中多筆資料的複合利用。

(三) 被引資料的來源分析

本研究依被引資料的蒐集者或彙編者將資料來源區分成政府機關、學術機構、民間單位、與個別研究四種。表3顯示：在整體樣本中，來源為政府機關的被引資料佔比最高，超過一半(53.88%)；學術機構者次之，佔比近兩成(18.70%)；來自民間單位與個別研究的資料比例都低，尤其以先前個別研究進行衍生的原創分析，在整體樣本中不到一成(8.53%)。

比較五個學門的被引資料來源，除去資料再用數量甚低的心理學門，可發現政府機關是其他四個學門所用資料來源之最，但在各學門的佔比上差距甚大，經濟學門高達66.56%，社會學門也超過一半(52.47%)，相對而言，政治與教育學門的使用量僅佔三至四成之間。學術機構在政治、社會，與教育三個學門的被引資料中，佔比約1/3(政治學門：34.44%；社會學門：32.47%)至1/4(教育學門：26.26%)，但在經濟學門就佔比極低(僅4.99%)。來自民間單位與

表3 被引資料來源分布(2001-2015)

學門／學科	資料蒐集者 彙編者		政府機關		學術機構		民間單位		個別研究		無法辨識	
	數量	%	數量	%	數量	%	數量	%	數量	%	數量	%
整體 (N=2,990)	1,611	53.88	559	18.70	458	15.32	255	8.53	107	3.58		
經濟學門 (n=1,504)	1,001	66.56	75	4.99	302	20.08	58	3.86	68	4.52		
經濟學 (n=1,001)	666	66.53	51	5.09	224	22.38	24	2.40	36	3.60		
農業經濟 (n=503)	335	66.60	24	4.77	78	15.51	34	6.76	32	6.36		
政治學門 (n=694)	255	36.74	239	34.44	62	8.93	117	16.86	21	3.03		
政治學 (n=389)	119	30.59	132	33.93	41	10.54	87	22.37	10	2.57		
公行國關 (n=305)	136	44.59	107	35.08	21	6.89	30	9.84	11	3.61		
社會學門 (n=385)	202	52.47	125	32.47	28	7.27	23	5.97	7	1.82		
社會學 (n=291)	138	47.42	114	39.18	14	4.81	19	6.53	6	2.06		
社會工作 (n=57)	51	89.47	3	5.26	1	1.75	1	1.75	1	1.75		
傳播學 (n=37)	13	35.14	8	21.62	13	35.14	3	8.11	0	0.00		
教育學門 (n=297)	118	39.73	78	26.26	49	16.50	43	14.48	9	3.03		
教育學 (n=243)	93	38.27	77	31.69	27	11.11	43	17.70	3	1.23		
體育學 (n=45)	21	46.67	0	0.00	18	40.00	0	0.00	6	13.33		
圖書資訊學 (n=9)	4	44.44	1	11.11	4	44.44	0	0.00	0	0.00		
心理學門 (n=110)	35	31.82	42	38.18	17	15.45	14	12.73	2	1.82		
心理學 (n=110)	35	31.82	42	38.18	17	15.45	14	12.73	2	1.82		

個別研究的資料，學門使用比例均低，多數低於兩成。

另一個值得注意的狀況是：對這四個資料再用較發達的學門而言，使用量都集中在兩個主要來源，將最高的兩個來源相加，即可佔全部被引資料的六至八成以上。換言之，每個學門均有其倚重的兩大特定來源，唯學門間兩大來源的比例有差距：經濟學門以政府機關及民間單位的資料為主；政治、社會，及教育學門則以政府機關及學術機構資料為主。但教育學相對於其他三個學門，資料來源的分布比較沒有那麼集中。卡方檢定顯示五個學門的資料來源分布（不含無法辨識者）具顯著差異，學門別與資料來源呈強度相關（ $\chi^2=611.404$, $df=8$, $p<0.001$, Cramer's $V=.322$ ）。

就六大學科的狀況來看，分布趨勢亦大致與學科所屬學門相近。經濟與農經均高度仰賴政府機關的資料，民間單位者次之，且比例已相當低；政治學、公行國關、社會學、教育學均較仰賴政府機關及學術機構的資料，且兩個來源的分布相對較均勻，兩者相加可達資料的六至八成。但也有若干歧異出現，例如，同屬政治學門的政治學與公行國關，在個別研究資料的使用比例上就出現明顯差距；教育學使用學術機構與個別研究的資料比例，也略高於教育學門整體。卡方檢定顯示：六大學科的資料來源分布呈顯著差異（ $\chi^2=666.707$, $df=15$, $p<0.001$, Cramer's $V=.290$ ）。更甚者，同屬經濟學門的經濟學與農經，資料來源分布也具顯著差異（ $\chi^2=24.428$, $df=3$, $p<0.001$, Cramer's $V=.130$ ）；同列政治學門下的政治學與公行國關亦然（ $\chi^2=26.675$, $df=3$, $p<0.001$, Cramer's $V=.203$ ）。上述結果顯示，學科別與資料來源呈中度相關。

（四）被引資料類型分析

本研究將資料類型區分為「系列調查」、「業務資料」及「一次性資料」（定義參見前節說明）。表4顯示，在整體樣本中，業務資料的使用量超過全部資料的一半（54.31%）；系列調查的使用略高於三成（32.31%）；一次性資料的使用僅佔一成左右（11.97%）。

就學門來看，經濟學門使用的資料類型與其他學門大不相同，以業務資料為大宗，使用比例高達3/4（74.87%）；相對而言，其他學門的業務資料使用量，都約佔1/3而已。社會、教育，與心理學門使用系列調查資料的比例則比較高，都超過一半以上。政治學門使用三種資料類型的比例則相對均勻，三種資料使用量的比值約為1.38：1.56：1。卡方檢定顯示五個學門之間，資料類型的分布具顯著差異，學門別與資料類型呈強度相關（ $\chi^2=611.404$, $df=8$, $p<0.001$, Cramer's $V=.322$ ）。

就六大學科的資料類型分布來看，同屬經濟學門的經濟學與農經，都是以業務資料居多，且都佔整體資料3/4上下。但同屬政治學門下的政治學與公行國關，資料類型的使用分布差異就比較大，在三種資料類型上，使用比例

表4 資料類型分布(2001-2015)

學門學科	業務資料		系列調查		一次性者		無法辨識	
	數量	%	數量	%	數量	%	數量	%
整體 (N=2,990)	1,624	54.31	966	32.31	358	11.97	42	1.40
經濟學門 (n=1,504)	1,126	74.87	266	17.69	85	5.65	27	1.80
經濟學 (n=1,001)	739	73.83	197	19.68	42	4.20	23	2.30
農業經濟 (n=503)	387	76.94	69	13.72	43	8.55	4	0.80
政治學門 (n=694)	241	34.73	273	39.34	174	25.07	6	0.86
政治學 (n=389)	95	24.42	174	44.73	115	29.56	5	1.29
公行國關 (n=305)	146	47.87	99	32.46	59	19.34	1	0.33
社會學門 (n=385)	121	31.43	208	54.03	54	14.03	2	0.52
社會學 (n=291)	74	25.43	172	59.11	43	14.78	2	0.69
社會工作 (n=57)	29	50.88	20	35.09	8	14.04	0	0.00
傳播學 (n=37)	18	48.65	16	43.24	3	8.11	0	0.00
教育學門 (n=297)	100	33.67	161	54.21	32	10.77	4	1.35
教育學 (n=243)	59	24.28	151	62.14	30	12.35	3	1.23
體育學 (n=45)	35	77.78	8	17.78	1	2.22	1	2.22
圖書資訊學 (n=9)	6	66.67	2	22.22	1	11.11	0	0.00
心理學門 (n=110)	36	32.73	58	52.73	13	11.82	3	2.73
心理學 (n=110)	36	32.73	58	52.73	13	11.82	3	2.73

差距可達 10%-20% 以上。社會學與教育學的資料類型分布比較相近，都是系列調查佔一半以上，業務資料佔 1/4 左右，一次性資料略高於一成。卡方檢定顯示六大學科之間，資料類型分布具顯著差異，學科別與資料類型呈強度相關 ($\chi^2=693.443$, $df=10$, $p<0.001$, Cramer's $V=.359$)。而同屬經濟學門的經濟學與農經，資料類型分布也具顯著差異，學科別與資料類型呈中度相關 ($\chi^2=18.218$, $df=2$, $p<0.001$, Cramer's $V=.111$)；同屬政治學門的政治學與公行國關亦然 ($\chi^2=40.667$, $df=2$, $p<0.001$, Cramer's $V=.243$)。

五、結論與建議

本研究調查 15 年間台灣社會科學學門領域內的量化資料再用情況，在期刊來源上，採取 TSSCI 收錄期刊為分析對象，足以代表台灣社會科學重要學科領域的研究行為。有別於前人以抽樣、推估，或從資料集來反尋再用論文的作法，本研究採逐篇檢視、全面清查的方式，在呈現資料再用的全貌上，證據基礎應較堅實，準確程度也較高。

如以本文所分析的五大學門為社會科學代表，則台灣社會科學學界透過資料再用來產出實徵論文的比例，低於 1/5 (佔整體實徵論文 17.38%)，且 15 年間比例大致持衡，年均介於 15%-22%，未見明顯增長或消退趨勢，與科學社群近年在資料再用比例出現明顯成長，大不相同 (Piwowar & Vision, 2013; Xia &

Liu, 2013; Zhang et al., 2011)。資料再用對於社會科學整體實徵研究的貢獻，規模可能大致就是如此。

資料再用在不同的社會學科領域之間，強度不同。觀察五大學門及其下屬學科，於資料再用比例上具有差距。本文認為這些差異應可歸因於學科本質差異，具體來說，經濟領域的資料再用高度普及，資料再用甚至可說是實徵研究的主流現象；而政治研究領域的資料再用程度也高，這是因為這兩個領域的主題關懷較常是宏觀現象，因此取用外部資料就可能是必要且唯一的研究途徑，相對而言，社會、教育，與心理領域在研究主題上，雖也可能分析宏觀或長期趨勢，因而取用外部資料，但整體來說，這些領域學者在主題上，從宏觀至微觀，切入層次相對多元，研究者能獨立蒐集資料的機會也比較大，因此資料再用程度較低。

林奇秀與賴璟毅(2017)的訪談結果也間接呼應上述觀點：資料再用的主要理由，最常是因為研究主題需要宏觀層級、大規模，且個人無力能及的資料，而經濟與政治的實徵研究即以這類為大宗。此外，歐美國家在1960年代即成立的社會科學資料典藏中心，名稱也突顯了經濟與政治領域對外部資料的強烈需求，例如當時英國的Social and Economic Archive Committee即以經濟資料為大宗；美國當時所成立的Inter-university Consortium for Political Research(即ICPSR前身)，與私人民意調查機構Roper Public Opinion Research Center，均以政治與公共事務資料為大宗(Nasatir, 1967)。由此即可看出，經濟與政治這兩大領域對外部資料的高度仰賴。

相對而言，台灣學界在心理學研究上，資料再用偏低，則與國外研究發現有出入。國外研究並無對心理學整體資料再用的調查結果，但Fear(2013)在探討社會科學第三方資料再用時，發現資料再用主題排名前五名之中，包含有「醫學與心理類」(排名第二)與「心理學與社會科學類」(排名第五)。雖然其分析基礎與本文完全不同，但單就第三方再用來看，心理學顯然具有相當程度的資料再用，是個再用程度不低的領域。但在台灣，心理學無論在整體資料再用或取用個別研究資料來進行衍生分析，數量都非常少。而且，如前文指出，本研究的心理學期刊中有四份是教育心理學期刊，佔了本研究心理學論文樣本近七成(68.83%)，更凸顯出心理學資料再用的罕見。林奇秀與賴璟毅(2017)所訪談的學者曾表示：台灣的心理學界並不鼓勵資料再用。這個說法與本研究分析結果是相符的。

本文亦從資料使用筆數、資料類型，與資料來源上辨析出不同學科領域的資料再用特徵。首先，經濟與政治學門不但是資料再用的大宗，而且平均來說，每篇論文使用的資料筆數也是較高的領域，一篇論文同時多筆資料相當常見；反之，社會、教育，與心理領域中，均以使用一筆資料為主。其次，在

資料來源上，政府機關是所有領域都最倚重的資料來源，但經濟與社會領域比其他領域都更加仰賴政府資料；相對而言，政治、教育，與心理對學術機構的資料，也有極高的使用，但經濟卻罕有使用學術機構資料。再者，在資料類型方面，經濟領域再度與眾不同，高度仰賴業務資料；相對而言，社會、教育、與心理則較仰賴系列調查；政治在業務資料與系列調查的使用量則約略相當。

然而，上述領域亦有共同之處：無論是對來源為個別研究或資料類型為一次性資料者，在每個領域的使用比例都非常低。這個結果與科學領域的資料再用研究發現大不相同。從既有文獻可得知，基因的資料再用幾乎均是先前研究的資料再用，天文或其他科學領域研究也有相當數量的資料再用是使用先前的個別研究數據 (Piwowar et al., 2011; Piwowar & Vision, 2013; Xia & Liu, 2013; Zhang, 2011)，但本文發現個別研究數據在台灣社會科學領域中，整體被用的比例非常低，不足全部資料集的一成；而一次性資料的使用也僅略高於一成。從這個結果來看，社會科學所需要的資料，主要是組織性、長期性的大規模資料，無論足以反映公私部門運行狀況的業務數據，或呈現社會現象逐年變遷的調查統計。林奇秀與賴璟毅 (2017) 對社會科學學者的訪談也顯示：個別研究資料有其特定問題意識，且有其特定產出時空情境，用在社會科學的衍生分析上，效用比較有限。綜合此次的研究結果，本文建議：社會科學的資料採用服務，與其汲汲於向學者徵集個別研究產出的資料，或許更應著力於蒐集、彙整、媒合來自公私部門的大規模、長期性數據資料，倘能進一步建立跨部會，甚或跨政府與民間單位的資料服務機制，讓資料資訊更透明，並降低資料取用障礙，如此應更能有效促成社會科學的資料再用，發揚既有資料的存在價值。

但本研究也具有一定的分析侷限，例如，從活化資料、提高再用的角度來看，社會科學資料的調查週期或發佈時間對再用的影響，是一個非常值得關注的議題，然而，本文的研究方法並無法回答這個問題，主要是目前學界在資料引註上甚乏明確統一的引文規範，不同作者提供的資料描述內容及其交代方式，歧異很大，我們或可從論文內文或原始資料集來判斷資料數據起迄時間，但不見得都能獲知其發佈時間與調查週期，也因此，這個攸關資料傳播與再用結構的問題，目前無法透過內容分析來觀察，有賴未來研究以其他方法探索之。此外，本文顯示不同學科在資料來源與資料類型上具有差異，可見資料再用行為具有領域性，然而，具體而言，資料再用行為受到哪些學科領域特質影響、造成哪些領域性的變異、這些變異對資料分享與再用帶來哪些促成或箝制的效果等，目前均尚屬未知，有待未來研究進一步探討。

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附錄一 本研究期刊樣本之學門/學科列表

社會學門(11份)	政治學門(11份)	教育學門(21份)	經濟學門(7份)	心理學門(7份)
社會學(5份) 人口學刊* 文化研究☆(2005~) 台灣社會學 臺灣社會學刊 調查研究：方法與應用 社工學(2份) 社會政策與社會工作學刊 臺大社會工作學刊 傳播學(4份) 新聞學研究 中華傳播學刊☆(2002~) 傳播與社會學刊☆(2006~) 傳播研究與實踐☆(2011~)	政治學(6份) 東吳政治學報 政治科學論叢 政治與社會哲學評論☆(2002~) 政治學報 臺灣民主季刊☆(2004~) 台灣政治學刊 公行國關(5份) 公共行政學報 行政暨政策學報 問題與研究季刊 遠景基金會季刊★(2002~) 選舉研究	教育學(17份) 科學教育學刊 特殊教育研究學刊 特殊教育學報 教育政策論壇 教育研究集刊 教育科學研究期刊★(2009~) 教育實踐與研究★(2007~) 教育學刊 教育學報 教科書研究☆(2008~) 華語文教學研究☆(2004~) 當代教育研究季刊★(2005~) 臺東大學教育學報★(2003~) 臺灣教育社會學研究 數位學習科技期刊☆(2008~) 課程與教學季刊 藝術教育研究 體育學(2份) 大專體育學刊 體育學報 圖資學(2份) 教育資料與圖書館學 圖書資訊學研究★(2006~)	經濟學(4份) 經濟研究 經濟論文 經濟論文叢刊 臺灣經濟預測與政策* 農業經濟(3份) 農業經濟叢刊 農業與經濟應用經濟論叢★(2008~)	心理學(7份) 中華心理衛生學刊* 中華心理學刊 中華輔導與諮商學報★(2008~) 本土心理學研究 教育心理學報 教育與心理研究*測驗學刊*★(2003~)

註：*為原列於TSSCI「綜合類」之期刊

☆為2001年後才出現的新刊(括號為發刊年份)

★為期刊更名者(括號為更名後首次發刊年份)



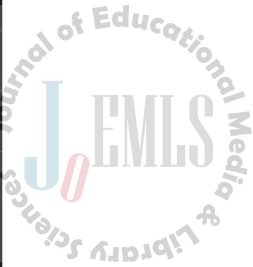
<http://joemls.tku.edu.tw>

附錄二 整體與學門再用論文資料使用筆數累計分布

學門 被引 資料數	整體			經濟學門			政治學門			社會學門			教育學門			心理學門		
	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %
1	899	60.58	899 60.58	266	44.56	266 44.56	198	58.06	198 58.06	184	75.72	184 75.72	191	84.51	191 84.51	60	77.92	60 77.92
2	244	16.44	1,143 77.02	127	21.27	393 65.83	64	18.77	262 76.83	25	10.29	209 86.01	19	8.41	210 92.92	9	11.69	69 89.61
3	138	9.30	1,281 86.32	76	12.73	469 78.56	30	8.80	292 85.63	17	7.00	226 93.00	10	4.42	220 97.35	5	6.49	74 96.10
4	79	5.32	1,360 91.64	49	8.21	518 86.77	21	6.16	313 91.79	4	1.65	230 94.65	3	1.33	223 98.67	2	2.60	76 98.70
5	56	3.77	1,416 95.42	33	5.53	551 92.29	16	4.69	329 96.48	6	2.47	236 97.12	1	0.44	224 99.12	0	0.00	76 98.70
6	21	1.42	1,437 96.83	16	2.68	567 94.97	4	1.17	333 97.65	1	0.41	237 97.53	0	0.00	224 99.12	0	0.00	76 98.70
7	16	1.08	1,453 97.91	9	1.51	576 96.48	3	0.88	336 98.53	3	1.23	240 98.77	1	0.44	225 99.56	0	0.00	76 98.70
8	11	0.74	1,464 98.65	8	1.34	584 97.82	2	0.59	338 99.12	1	0.41	241 99.18	0	0.00	225 99.56	0	0.00	76 98.70
9	2	0.13	1,466 98.79	0	0.00	584 97.82	0	0.00	338 99.12	1	0.41	242 99.59	0	0.00	225 99.56	1	1.30	77 100.00
10	6	0.40	1,472 99.19	4	0.67	588 98.49	1	0.29	339 99.41	1	0.41	243 100.00	0	0.00	225 99.56			
11	3	0.20	1,475 99.39	3	0.50	591 98.99	0	0.00	339 99.41				0	0.00	225 99.56			
12	2	0.13	1,477 99.53	2	0.34	593 99.33	0	0.00	339 99.41				0	0.00	225 99.56			
14	2	0.13	1,479 99.66	1	0.17	594 99.50	0	0.00	339 99.41				1	0.44	226 100.00			
15	1	0.07	1,480 99.73	1	0.17	595 99.66	0	0.00	339 99.41									
18	1	0.07	1,481 99.80	0	0.00	595 99.66	1	0.29	340 99.71									
19	1	0.07	1,482 99.87	1	0.17	596 99.83	0	0.00	340 99.71									
25	1	0.07	1,483 99.93	0	0.00	596 99.83	1	0.29	341 100.00									
27	1	0.07	1,484 100.00	1	0.17	597 100.00												
總計	1,484	100.00		597	100.00		341	100.00		243	100.00		226	100.00		77	100.00	

附錄三 六大學科再用論文資料使用筆數累計分布

學門 被引 資料數	經濟			農經			政治			公行國關			社會			教育		
	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %	數量	%	累計 數量 %
1	167	42.28	167 42.28	99	49.01	99 49.01	108	57.75	108 57.75	90	58.44	90 58.44	150	76.92	150 76.92	160	86.02	160 86.02
2	88	22.28	255 64.56	39	19.31	138 68.32	38	20.32	146 78.07	26	16.88	116 75.32	19	9.74	169 86.67	15	8.06	175 94.09
3	52	13.16	307 77.72	24	11.88	162 80.20	13	6.95	159 85.03	17	11.04	133 86.36	16	8.21	185 94.87	5	2.69	180 96.77
4	39	9.87	346 87.59	10	4.95	172 85.15	11	5.88	170 90.91	10	6.49	143 92.86	3	1.54	188 96.41	3	1.61	183 98.39
5	20	5.06	366 92.66	13	6.44	185 91.58	8	4.28	178 95.19	8	5.19	151 98.05	4	2.05	192 98.46	1	0.54	184 98.92
6	10	2.53	376 95.19	6	2.97	191 94.55	4	2.14	182 97.33	0	0.00	151 98.05	0	0.00	192 98.46	0	0.00	184 98.92
7	6	1.52	382 96.71	3	1.49	194 96.04	1	0.53	183 97.86	2	1.30	153 99.35	2	1.03	194 99.49	1	0.54	185 99.46
8	3	0.76	385 97.47	5	2.48	199 98.51	2	1.07	185 98.93	0	0.00	153 99.35	0	0.00	194 99.49	0	0.00	185 99.46
9	0	0.00	385 97.47	0	0.00	199 98.51	0	0.00	185 98.93	0	0.00	153 99.35	1	0.51	195 100.00	0	0.00	185 99.46
10	3	0.76	388 98.23	1	0.50	200 99.01	1	0.53	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
11	3	0.76	391 98.99	0	0.00	200 99.01	0	0.00	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
12	2	0.51	393 99.49	0	0.00	200 99.01	0	0.00	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
14	1	0.25	394 99.75	0	0.00	200 99.01	0	0.00	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
15	0	0.00	394 99.75	1	0.50	201 99.50	0	0.00	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
18	0	0.00	394 99.75	0	0.00	201 99.50	0	0.00	186 99.47	0	0.00	153 99.35	0	0.00	195 100.00	0	0.00	185 99.46
19	1	0.25	395 100.00	0	0.00	201 99.50	0	0.00	186 99.47	1	0.65	154 100.00	0	0.00	195 100.00	1	0.54	186 100.00
25				0	0.00	201 99.50	0	0.00	186 99.47									
27				1	0.50	202 100.00	1	0.53	187 100.00									
總計	395	100.00		202	100.00		187	100.00		154	100.00		195	100.00		186	100.00	





The Reuse of Quantitative Data in Social Sciences in Taiwan: 2001-2015

Chi-Shiou Lin^{a*} Ching-Yi Lai^b

Abstract

This study explored the reuse of existing quantitative data in original social sciences research in Taiwan. Using the 2015 TSSCI List as the basis of journal selection, this study focused on 57 journals listed under the subject divisions of economics, political science, sociology, education, and psychology. Journal issues published between 2001 and 2015 were manually scanned to identify data reuse papers. The characteristics of the reuse papers and the cited data were recorded for the subsequent subject division-level and subject discipline-level analyses. A total of 1,484 reuse papers were identified, which accounted for 17.38% of the total empirical study papers. Among the five subject divisions, economics and political science had the highest percentages of data reuse, while psychology had the lowest. Those reuse papers together cited 2,990 datasets. Most of the datasets were used in economics and political science papers. Further, these two subject divisions had noticeably larger proportions of papers that use more than one dataset. In contrast, papers using only one dataset were the majority for the rest. In regards to data source and data type, datasets originated from government agencies as well as data generated from business operations accounted for the majority of the cited data, but significant differences existed among those subjects. As opposed to the frequently used business and series survey data, data generated from independent research projects as well as data that were non-continuous and one-time in nature were rarely reused in social sciences research. Based on the study findings, it is recommended that data services for social sciences research should focus more on large-scaled continuous data generated from governments and research institutions. A service mechanism that bridges users and data providers from public and private sectors would also enhance data reuse and increase the value of existing data.

Keywords: Data reuse, Data citation, Quantitative data, Social sciences

SUMMARY

The rise of e-science and data curation in the recent decades has prompted the sharing and reuse of research data in sciences. However, investigations on how and to what extent the existing data have been used for derivative, original

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research are still rare. Among the limited number of research, most has focused on data reuse in science disciplines, particularly, in genetics and astronomy. Rarely has the existing research examined data reuse in social sciences.

Further, due to the lack of standardized data citation practices in current academic writings, most of the existing data reuse studies have identified data reuse papers based on the presence of data registry keys (e.g., the DOIs of datasets of a particular data repository) in the references and/or the main texts of research papers. While this method works well for some scientific disciplines that have data sources that are well archived by one or two data repositories, it is less effective for identifying data reuse papers in social sciences as the potential data sources are more disperse and sporadically distributed. Moreover, not all of the datasets in social science papers are deposited in data repositories and there might not be registry keys for those datasets that have actually been reused. For social science research outside of the English-speaking world, relying on data registry keys is even more impractical as most of the reused datasets may have never been registered in international data repositories or data citation indexes.

This study thus adopted another approach. The authors manually scanned the empirical research papers published within a body of social science journals to identify all papers that have empirical analysis which were based wholly or partially on existing datasets. With the papers drawn from a time span of 15 years (2001-2015), this study sought to answer the following questions:

1. To what extent have data reuse papers accounted for the social science research papers? Were there observable growths in data reuse in social sciences over the 15 years?
2. How many datasets have been used in the data reuse papers? Were there observable growths in dataset usage?
3. What were the major sources of data for the social sciences disciplines? Where there significant differences in data sources among various social sciences disciplines?
4. What were the major data types for social science disciplines? Were there significant differences in data types among various social sciences disciplines?

This study employed content analysis on the papers published by 57 journals that were included in the 2015 journal list from the Taiwan Social Sciences Citation Index (TSSCI). The 57 journals together represented five larger subject divisions (i.e., economics, political sciences, social sciences, education, and psychology) or eleven smaller subject disciplines. Each paper published between 2001 and 2015 was examined to ascertain if it constituted a data reuse paper. For each data reuse paper, the data reuse characteristics as well as the characteristics of the used datasets were systematically recorded for later analysis.

Based on the analyses, it was found that data reuse papers accounted for 11.99% of the entire sample of research papers (including empirical and non-empirical research papers) and 17.38% for the empirical study papers. The subject division of economics constituted the largest user group of existing data in empirical research; it claimed 40.23% of the total data reuse papers (Table 1). However, the analysis of chronological distributions of the data reuse papers showed no obvious increase or decrease of data reuse in the entire sample or by subject division/discipline.

Table 1 The Distribution of Data Reuse Papers in Taiwan Social Sciences Research, 2001-2015

Subject Division/ Subject Discipline	Number of research papers	Number of empirical papers	No. of the data reuse papers (% for the total reuse papers)	% - total research papers	% - total empirical papers	Rank 1*	Rank 2*
Total	12,381	8,541	1,484(100.00)	11.99	17.38		
Economics Div.	1,125	750	597(40.23)	53.07	79.60		
Economics	764	469	395	51.70	84.22	1	1
Agri. Eco.	361	281	202	55.96	71.89	2	2
Political Sci. Div.	2,265	836	341(26.62)	15.06	40.79		
Political Science	1,216	442	187	15.38	42.31	4	4
Public Admin. & Int'l Affairs	1,049	394	154	14.68	39.09	6	5
Social Sci. Div.	1,690	1,045	243(16.37)	14.38	23.25		
Sociology	602	381	195	32.39	51.18	3	3
Social Work	292	208	30	10.27	14.42	9	6
Communication	796	456	18	2.26	3.95	10	10
Education Div.	5,304	4,131	226(15.23)	4.26	5.47		
Education	3,541	2,535	186	5.25	7.34	5	7
Physical Education	1,306	1,219	34	2.60	2.79	8	9
Library & Info Sci.	457	377	6	1.31	1.59	11	11
Psychology Div.	1,997	1,779	77(5.19)	3.86	4.33		
Psychology	1,997	1,779	77	3.86	4.33	7	8

* Rank 1: ranks for the subject divisions; Rank 2: ranks for the subject disciplines based on the proportions of data reuse papers divided by empirical study papers.

The 1,484 data reuse papers together have used 2,990 datasets; that is, each paper has used an average of 2.01 datasets with a standard deviation of 2.02. Observing data usages at the subject division and subject discipline levels, economics research again topped the other subjects (Table 2). Chronological distributions of the dataset usages again showed that there was no obvious increase or decrease of per-paper dataset usages from 2001 to 2015.

In regards to the distributions of data sources and data types, Table 3 shows that data outsourced from government agencies constituted 53.88% of the entire used data, followed by those from academic institutions (18.70%).

Table 2 The Distribution of Dataset Usages among the Data Reuse Papers, 2001-2015

Subject Division/ Subject Discipline	No. of reuse papers (% - total reuse papers)	No. of datasets (% - total datasets)	Avg.	St.D.	Rank 1*	Rank 2*	Rank 3*
Total	1,484(100.00)	2,990(100.00)	2.01	2.02			
Economics Div.	597(40.23)	1,504(50.30)	2.52	2.38	1		
Economics	395	1,001	2.53	2.21		1	1
Agricultural Eco.	202	503	2.49	2.68		2	2
Political Sci. Div.	341(26.62)	694(23.21)	2.04	2.11	2		
Politi Sci.	187	389	2.08	2.31		3	3
Publical Admin. & Int'l Affairs	154	305	1.98	1.85		4	5
Social Sci. Div.	243(16.37)	385(12.88)	1.58	1.39	3		
Sociology	195	291	1.49	1.16		5	7
Social Work	30	57	1.90	2.07		8	6
Communication	18	37	2.06	2.07		10	4
Education Div.	226(15.23)	297(9.93)	1.31	1.12	5		
Education	186	243	1.31	1.20		6	10
Physical Education	34	45	1.32	0.68		9	11
Library & Info Sci.	6	9	1.50	0.84		11	7
Psychology Div.	77(5.19)	110(3.68)	1.43	1.13	4		
Psychology	77	110	1.43	1.13		7	9

* Rank 1: ranks for the subject divisions by the average dataset usage;

Rank 2: ranks for the subject disciplines by the total number of dataset;

Rank 3: ranks for the subject disciplines by the average dataset usage.

As to data type, Table 4 shows that business data constituted the majority of the used data (54.31%), followed by series surveys (32.31%). The use of one-time data was extremely rare (11.97%).

Based on the analysis, this study concluded that, from 2001 to 2015, slightly lower than one fifth (17.38%) of the social science empirical research in Taiwan was based on the reuse of existing datasets. During the 15 years, both paper production based on data reuse as well as the quantity of datasets used have remained steady. This is possibly the capacity limit of data reuse in generating novel analysis for Taiwan social science research.

Chi-square tests showed that, for both data source and data type of the reused datasets, significant differences existed among the five social sciences subject divisions as well as six major subject disciplines. This means that the data needs and the data reuse behaviors are highly diverse and heterogeneous in different social science subject fields. Economics and political science research constituted the major users of existing data. It was possibly due to the prevalent macro-level research inquiries in those fields, and outsourcing became the only means for data acquisition, particularly for the large-scaled datasets.

Table 3 The Distribution of Data Sources for the Data Reuse Papers, 2001-2015

Data Source Div./Discipline	Government Agencies		Academic Institutions		Private Sectors		Individual Researchers		Un-recognized	
	n.	%	n.	%	n.	%	n.	%	n.	%
Total (N=2,990)	1,611	53.88	559	18.70	458	15.32	255	8.53	107	3.58
Eco. Div. (n=1,504)	1,001	66.56	75	4.99	302	20.08	58	3.86	68	4.52
Economics (n=1,001)	666	66.53	51	5.09	224	22.38	24	2.40	36	3.60
Agri. Eco. (n=503)	335	66.60	24	4.77	78	15.51	34	6.76	32	6.36
Poli. Sci. Div. (n=694)	255	36.74	239	34.44	62	8.93	117	16.86	21	3.03
Poli. Sci. (n=389)	119	30.59	132	33.93	41	10.54	87	22.37	10	2.57
Pub. Admin. & Int'l Affairs (n=305)	136	44.59	107	35.08	21	6.89	30	9.84	11	3.61
Social Sci. Div. (n=385)	202	52.47	125	32.47	28	7.27	23	5.97	7	1.82
Sociology (n=291)	138	47.42	114	39.18	14	4.81	19	6.53	6	2.06
Soc. Work (n=57)	51	89.47	3	5.26	1	1.75	1	1.75	1	1.75
Comm. (n=37)	13	35.14	8	21.62	13	35.14	3	8.11	0	0.00
Edu. Div. (n=297)	118	39.73	78	26.26	49	16.50	43	14.48	9	3.03
Education (n=243)	93	38.27	77	31.69	27	11.11	43	17.70	3	1.23
Phy. Edu. (n=45)	21	46.67	0	0.00	18	40.00	0	0.00	6	13.33
Lib & Info (n=9)	4	44.44	1	11.11	4	44.44	0	0.00	0	0.00
Psycho. Div. (n=110)	35	31.82	42	38.18	17	15.45	14	12.73	2	1.82
Psychology (n=110)	35	31.82	42	38.18	17	15.45	14	12.73	2	1.82

Table 4 The Distribution of Data Types in the Data Reuse Papers, 2001-2015

Data Type Div./Discipline	Business Data		Series Surveys		One-time Data		Un-recognized	
	n.	%	n.	%	n.	%	n.	%
Total (N=2,990)	1,624	54.31	966	32.31	358	11.97	42	1.40
Eco. Div. (n=1,504)	1,126	74.87	266	17.69	85	5.65	27	1.80
Economics (n=1,001)	739	73.83	197	19.68	42	4.20	23	2.30
Agri. Eco. (n=503)	387	76.94	69	13.72	43	8.55	4	0.80
Poli. Sci. Div. (n=694)	241	34.73	273	39.34	174	25.07	6	0.86
Poli. Sci. (n=389)	95	24.42	174	44.73	115	29.56	5	1.29
Pub. Admin. & Int'l Affairs (n=305)	146	47.87	99	32.46	59	19.34	1	0.33
Social Sci. Div. (n=385)	121	31.43	208	54.03	54	14.03	2	0.52
Sociology (n=291)	74	25.43	172	59.11	43	14.78	2	0.69
Soc. Work (n=57)	29	50.88	20	35.09	8	14.04	0	0.00
Comm. (n=37)	18	48.65	16	43.24	3	8.11	0	0.00
Education Div. (n=297)	100	33.67	161	54.21	32	10.77	4	1.35
Education (n=243)	59	24.28	151	62.14	30	12.35	3	1.23
Phy. Edu. (n=45)	35	77.78	8	17.78	1	2.22	1	2.22
Lib. & Info. (n=9)	6	66.67	2	22.22	1	11.11	0	0.00
Psychology Div. (n=110)	36	32.73	58	52.73	13	11.82	3	2.73
Psychology (n=110)	36	32.73	58	52.73	13	11.82	3	2.73

Also note that data from previous individual research as well as data that were one-time in nature (non-continuous, slice-of-time data) were found to be rarely reused in social sciences. A policy implication from this finding is that the collection development of data repositories for social sciences should focus on acquiring large-scaled surveys as well as business transaction data generated from important governments and private sectors rather than focusing on individual research data that provide very limited reuse opportunities for future researchers.

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Level of Information Literacy among Upper-Secondary School Students in Thailand and the Problems They Encounter

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Abstract

The research work described in this paper investigated the information literacy (IL) level of upper-secondary students in the southernmost provinces of Thailand and the problems that they encounter with respect to IL. Data were collected from a sample comprising of 390 students, who were selected by employing stratified random sampling. The research instruments included an IL test and a questionnaire concerning the problems encountered pertaining to IL. The data were analyzed based on percentages, means, and standard deviations. Moreover, significant differences were tested using t-tests, F-tests and a Scheffé test. The results revealed that, overall, the students' average level of IL, based on the seven standards, was at the Pass level. However, some students demonstrated Fail level of IL in Standard 3 (able to analyze, evaluate, and select the information required), as well as Standard 7 (have knowledge and the necessary skills to use ICT). Overall, the students encountered problems pertaining to IL at a moderate level. All variables, including sex, stream of study, GPA, and school location, affected the students' level of IL. However, only school location significantly impacted problems pertaining to IL. The researchers propose that teaching and learning activities should be redesigned utilizing collaborative teaching involving teachers, librarians, and ICT personnel in order to enhance students' IL. The Educational Supervisory Unit and the administrators of upper-secondary schools should set guidelines/standards for providing modern ICT equipment to students, which they can use in classrooms, libraries, and computer rooms.

Keywords: Information literacy, Southernmost Thailand, High school students, Library Science, Assessment, Problems of information literacy

Introduction

The need for people to be able to function effectively in a knowledge-driven society and to cope with continuous social, economic, and technological change has triggered an array of arguments about the competencies people require to have a successful life and career in the 21st century. The European Council

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and the European Parliament have adopted a framework of key competencies necessary for lifelong learning. The framework identifies and defines the key competencies that citizens need for ensuring personal fulfillment, social inclusion, active citizenship, and employability in a knowledge-driven society. The framework includes competence in “traditional” subjects, such as mother-tongue literacy, numeracy, and knowledge of foreign languages, science, and technology. Furthermore, it covers other competencies such as learning to learn, digital competence, social and civic competence, initiative-taking, entrepreneurship, cultural awareness, and self-expression (European Commission, 2017).

The American Library Association (ALA, 2017) states that “literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society.” Correia (2002) suggests that literacy is active and effective, and it promotes responsible citizenship, while Boekhorst (2003) adds the aspect of self-actualization and Bundy (2004) gives importance to social responsibility in this regard. These competencies are referred to as “information literacy” (IL) in library science. Proponents of IL believe that it is the most critical kind of literacy for the 21st century, which is of utmost importance for the realization of not only most personal, academic, and professional goals but also for economic development. The Association of College and Research Libraries (ACRL, 2000) highlights IL as an educational goal that is “common to all disciplines, to all learning environments, and to all levels of education.” Moreover, it is an important factor in the workplace and is perceived to be an ongoing process that should be facilitated throughout one’s life (Boekhorst, 2003).

In modern society, every individual requires an increasingly sophisticated set of competencies in order to find, handle, and use information effectively. Facilitating the development of IL, as an essential competency in the 21st century, is therefore a task of the utmost importance. It has also created a need for a re-conceptualization of the roles and responsibilities of professionals involved with libraries and imparting information in a new learning environment (Virkus, 2006). Librarians have always endeavored to assist library users to develop the ability of locating and finding information. However, in an increasingly complex information environment, students are presented with diverse and abundant choices with regard to sources of information that is “available in different forms, places, and increasingly in unfiltered forms and in uncertain quality” (Wilson, 2001, p. 2). Students have been found to possess insufficient IL in a series of studies (Centre for Information Behaviour and the Evaluation of Research, British Library, & Joint Information Systems Committee, 2008; Cole & Kelsey, 2004; Hepworth, 1999; Lonsdale et al., 2003; Pejova, 2002; Ray & Day, 1998; Stern, 2003).

The southernmost region of Thailand is located near Malaysia, which covers five provinces, including Narathiwat, Yala, Pattani, Satun, and Songkla. Majority of the population in this area comprises of Muslims. There are various kinds of schools that students can attend, but based on the Muslim way of life, the most popular ones in this region are Islamic private schools. Additionally, a number of studies have revealed low educational quality to be a major problem in this area, which includes an inefficacious learning process owing to a severe lack of effective communication, analytical thinking, teaching personnel, and cultural diversity (Farrungsang, Uttayawalee, Sungtong, & Haji-Awang, 2011; Wae-u-sengn, 2013).

Hence, the study concerning upper-secondary school students' IL and the problems they encounter in developing their IL is necessary, in order to improve the educational quality and management. This is exceedingly important, as it contributes to the limited knowledge available about IL of upper-secondary school students. Furthermore, empowering students by developing their IL is an important way of enhancing their ability to live in a global community, and this research will help teachers and librarians prepare their students to use information for supporting their studies appropriately.

Objectives of the Study

The primary objectives of the study were as follows:

1. Investigate the IL level of upper-secondary students in the southernmost provinces of Thailand.
2. Examine the problems that upper-secondary students studying in the southernmost provinces encounter with respect to IL development.
3. Analyze the students' level of IL and the problems that they encounter, by taking other variables into consideration, namely sex, stream of study, GPA, and school location.

Hypotheses

This research set out to test the following hypotheses:

1. The level of IL of upper-secondary students in the southernmost provinces of Thailand would differ based on the following variables: sex, stream of study, GPA, and school location.
2. The problems concerning IL encountered by upper-secondary students studying in the southernmost provinces would differ based on the following variables: sex, stream of study, GPA, and school location.

Literature Review

Many definitions and concepts pertaining to IL have been offered by different information organizations and professionals. According to ACRL (2000), IL is a set of abilities that require individuals to “recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” On the other hand, according to Doyle (1994), IL is an intellectual framework employed for understanding, finding, and evaluating information and implies the ability to access, evaluate, and use information from a variety of sources; it also involves one’s ability to recognize when information is needed and know the way to learn. UNESCO (2016) suggests that IL “empowers people in all walks of life to seek, evaluate, use, and create information effectively to achieve their personal, social, occupational, and educational goals. It is a basic human right in a digital world and promotes social inclusion in all nations.”

Information literacy level and variables concerning upper-secondary school students

While many upper-secondary school students profess to be confident in at least a few aspects of IL (Herring, 2009; Latham & Gross, 2008), in reality, when their IL skills are tested or assessed in college, the majority of them receive poor scores or fail to acquire passing marks (Maughan, 2001). In their study, Smith, Given, Julien, Ouellette, and DeLong (2013) found that the IL skills of upper-secondary school students were insufficient, as they lacked skills that are required to effectively and efficiently complete undergraduate course work. Several students were unable to demonstrate sophisticated information searching and critical evaluation skills (Julien & Barker, 2009). Furthermore, Adams (1999) found that upper-secondary school students faced difficulty in evaluating information while writing their science assignments. While Brem, Russell, and Weems (2001) discovered that upper-secondary school students could not decide on the reliability and correctness of websites, Brill, Falk, and Yarden (2004) found that upper-secondary school students studying biology read through science documents superficially, without thinking about them intently or analyzing their content. In addition, Heinström (2006) found that most students tended to ascertain the relevance of information based on easy accessibility and regarded only superficial criteria for considering information. Head and Eisenberg (2009), along with Denison and Montgomery (2012), found that the participants of their study encountered difficulties while conducting their research and expressed their frustration concerning the information search process, especially in the digital age.

The findings of Chang et al. (2012), who studied IL skills of students studying in secondary schools in Singapore, asserted that students needed to

develop their skills in order to use, synthesize, and evaluate information. A case study of a secondary school in Hong Kong revealed certain significant findings stating that the strength pertaining to students' IL was the ability to identify potential sources of information, whereas the weakness was the ability to use information responsibly and ethically (Chu, Yeung, & Chu, 2012). Furthermore, a study of Kuwaiti upper-secondary school students found that the majority of students lacked skills with regard to catalog searching as well as use and selection of information sources (Rehman & Alfaresi, 2009).

The literature available worldwide revealed that demographic differences exert an influence on the use of information (Martin, 2011). Liu and Sun's (2012) findings revealed that males were better off than females regarding certain aspects concerning IL, namely information consciousness, information competence, and information ethics. Certain studies also indicate a connection between IL and students' performance as well as academic achievement. Levels of information competency are associated with higher GPAs and both short-term and long-term students' success (Cameron, Wise, & Lottridge, 2007; Glendale Community College, 2007; Katz et al., 2008). Foo et al. (2014) indicated that the types of schools and academic streams of study seemed to exert significant influences on IL. Harrison and Newton's (2010) research concluded that a strong relationship existed between performance of IL skills and students' academic performance throughout their degree program. One's intelligence or cognitive ability is considered to be the most significant indicator of academic success (Jensen, 1998; Kuncel, Ones, & Hezlett, 2001; Mayer, 2011). Some researchers argue that information searching requires the same set of skills to a certain extent at least, which is measured by common intelligence tests, including several analytical ones (Lenox & Walker, 1993).

Research findings, concerning IL assessment of school students and undergraduate students in Thailand, found that the existent levels of IL were different; overall, they were moderate (Maitongthong, 2011). With respect to IL of upper-secondary school students, in terms of information retrieval, information use, information evaluation, and their ability to access information, it was found that each was different. However, they were mostly measured to be at the moderate level (Busabung, 2007; Cheunwinya, 2011; Dourungkul, 1997; Saengsoda, 2010). Moreover, it is important to note that Songsaengchan, Chansawang, and Prapinpongsakorn (2008) determined that female students had a higher IL level than male ones.

Problems pertaining to promoting information literacy

Most teachers agreed that IL was extremely important for students. Information literacy helps students attain lifelong learning; it also helps them

to learn on their own in a better manner. Thus, students do require IL skills (Aroonsri, Loipha, & Vongprasert, 2014). Studies addressing the problems encountered when promoting IL asserted that teaching and learning IL in schools was not available as a course (Cheunwinya, 2011). Integration of IL into each subject course is necessary and of utmost importance (Aroonsri et al., 2014). The findings of Pakhathirathien and Siriwipat (2012) indicate that students from the three southernmost provinces of Thailand experienced moderate-level problems when using the Internet. Moreover, in their opinion, not enough computers were available, and they experienced problems while accessing the Internet.

To summarize, IL of upper-secondary school students preparing to enroll in colleges is important. However, poor research skills still seem to be the norm not only in Thailand but also throughout the world. In addition, while promoting IL, most schools in Thailand experience problems with respect to internet access, and no educational courses on IL are available.

Conceptual Framework

Numerous professional organizations have developed standards and rubrics, which offer a framework to those who are involved in teaching information skills. These include ACRL and the American Association of School Librarians (AASL), which makes use of “Standards for the 21st Century Learner” (American Association of School Librarians [AASL], 2017). Furthermore, Sacchanand’s study (2011) concerning Thailand suggested six standards and indicators of IL for Thai students, which are as follows: 1) Students perceive the importance and necessity of information; 2) Students are aware of various sources of information and capable of using information retrieving tools; 3) Students can analyze, evaluate, and select the information that they need; 4) Students have the ability to compile, organize, and synthesize information; 5) Students are able to use information to produce and present their work; 6) Students are moral, obey laws, and possess a sense of social responsibility pertaining to information. In addition, the Ministry of Education, Thailand (2008) has issued technology standards and indicators for upper-secondary students. Overall, the standard for IL and problems pertaining to IL for upper-secondary students have been established in the conceptual framework of this research, as illustrated below.

Method

Participants

The population of this study included 16,228 upper-secondary students studying in schools located in five southern provinces of Thailand, namely Narathiwat (4,349), Yala (3,719), Pattani (6,020), Satun (950), and the Songkhla

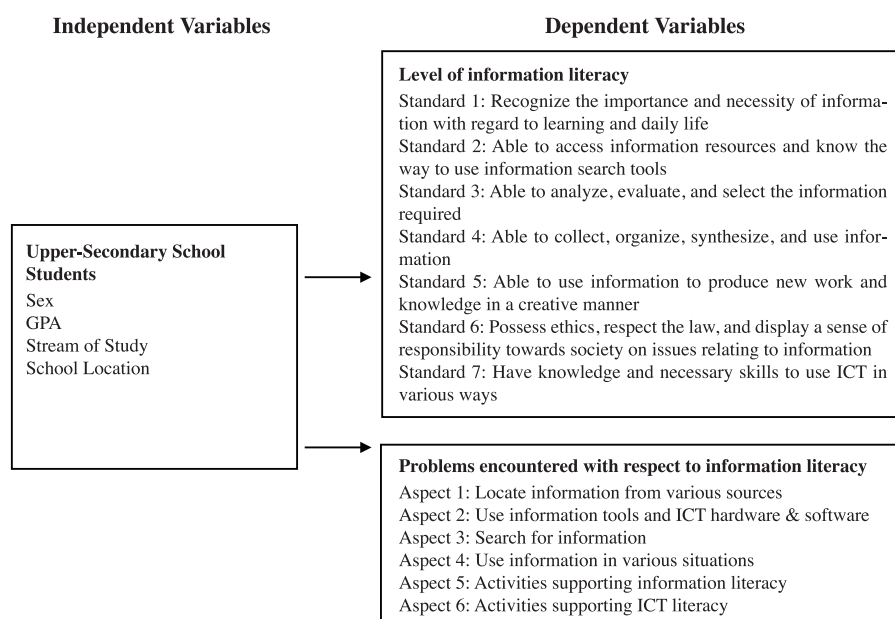


Figure 1 Conceptual Framework of Upper-Secondary School Students: Variables, Levels of IL, and Problems Encountered Concerning IL

districts of Thapa, Jana, Nathavee, and Sabayoi (1,190). One sample included 390 students, where the sample's size was determined using Yamane's formula; it was selected by stratified simple random sampling, according to the students' province, sex, GPA, stream of learning, based on the ratio of the population.

Instruments

Data were collected using two research instruments, namely an IL test and a questionnaire, which were designed according to the Indicator of Information Literacy of Thai Students (Sacchanand, 2011) and the Indicator of ICT for Upper-Secondary Students (refer to Figure 1 for details; Ministry of Education, Thailand, 2008). The IL test provided four multiple-choice options for each question and contained a total of 56 items, covering seven standards; there were eight items in each standard.

The questionnaire collected demographic information relevant to the variables of interest to the study and the problems pertaining to IL, which were collected according to the information obtained from the reviewed literature and suggestions from experts. Subsequently, they were divided into six aspects, which are as follows: locating information from various sources, using information tools and ICT hardware and software, searching for information, utilizing information in various situations, activities supporting IL, and activities supporting ICT literacy.

In each aspect, five items were included, to form a total of 30 items. The Likert 5-point rating scale (5 = very high, 4 = high, 3 = moderate, 2 = low, 1 = very low) was employed to determine the level of the problems encountered by students pertaining to IL.

These two research instruments were checked for content validity by six experts: four from a university, one from a school, and one from the Educational Supervisory Unit. In order to determine the validity of this study, the Cronbach method was employed with respect to the IOC (Index of Consistency); an item with scores between 0.5-1.00 was accepted, an item with scores lower than 0.5 was deleted. Subsequently, the instruments were tested for reliability by 40 students, who were not included in the sample of this study. The reliability of the instruments was analyzed by α -Coefficient; the instruments' total reliability was calculated to be 0.93.

Data collection and analysis

The researchers contacted school administrators and requested for their participation and permission to conduct the research, following which they administered the IL test and questionnaire with assistance from the assigned class teacher. Data from the 390 participants were analyzed using SPSS Statistics, a software for conducting statistical analysis, according to the research objectives. The descriptive statistics that were used included percentages, means, and standard deviations, while t-tests, F-tests, and a Scheffé test were employed to check for significant differences in the data. To ascertain a clear finding, the very high, high, moderate, low, and very low levels of IL problems from the questionnaire were grouped to form three levels: low, moderate, and high, using absolute criteria to justify the mean score of the IL problems.

Data from the test were checked and collected. Each correct answer added one point to the score, while a wrong answer added zero points. Two criteria were used to interpret the scores obtained from the test and the level of IL. Furthermore, five levels of IL were set up to categorize the sample, and the level of scores from 0-56 and 0-8 was calculated according to the five levels. The first criterion was concerned with the overall seven standards of IL (all 56 items in the test), and the second one included each of the seven standards (eight items each), which have been provided in the table below. Moreover, the data obtained from the questionnaire were thoroughly analyzed.

Results

In this section, the findings and discussions of the research have been presented in the following five parts: 1) sample demographics, 2) information literacy level of upper-secondary students in schools, 3) problems pertaining to

Table 1 Criteria Used to Justify the Scores Obtained from the Test Conducted for Ascertaining All Seven Standards of IL and Each of the Seven Standards Individually

Score		Level of information literacy
I. Seven standards of information literacy (all 56 items)	II. Each of the seven standards individually (8 items each)	
44.8-56.0	6.4-8.0	Excellent
39.2-44.7	5.6-6.3	Good
33.6-39.1	4.8-5.5	Fair
28.0-33.5	4.0-4.7	Pass
0-27.9	0-3.9	Fail

information literacy encountered by upper-secondary students studying in schools located in the southernmost provinces, 4) hypotheses tests, 5) opinions of and suggestions from the upper-secondary school students, concerning information literacy, obtained from the open-ended section of the questionnaire.

Sample Demographics

The demographic characteristics of the sample revealed that 70% of the students in schools were female, whereas the males constituted only 30% of the sample population. Their GPA levels were as follows: Excellent (12.3%), Good (63.9%), and Fair (23.8%); 80% students studied in the science-mathematics stream, while 20% studied in the arts stream; 37.2% students studied in schools located in the province Pattani, 26.7% in Narathiwat, 22.8% in Yala, 5.9% in Satun, and 7.4% in Songkhla (see Table 2).

Table 2 Sample Demographics

Sample Demographics		No.	Percentage
Sex	Total	390	100.00
	Male	117	30.0
	Female	273	70.0
Stream of study	Science-mathematics	312	80.0
	Arts	78	20.0
GPA	Excellent (3.01-4.00)	48	12.3
	Good (2.01-3.00)	249	63.9
	Fair (1.01-2.00)	93	23.8
Province (school location)	Narathiwat	104	26.7
	Pattani	145	37.2
	Yala	89	22.8
	Satun	23	5.9
	Songkhla	29	7.4

Information literacy level of upper-secondary school students

The primary finding with regard to the students' IL was that overall, as

shown in Table 3, among the seven standards, most students achieved a Pass level (average score 31.45 out of 56). Based on each standard, they achieved a Pass level in Standard 1: Able to recognize the importance and necessity of information in learning and daily life (average score 4.34) and in Standard 6: Possess ethics, respect the law, and display a sense of responsibility towards society on issues pertaining to information (average score 4.15). The students achieved a Moderate level in Standard 4: Able to collect, organize, synthesize, and use information (average score 4.96), and Standard 5: Able to use information to produce new work and knowledge in a creative manner (average score 4.83). Furthermore, they achieved a Good level in Standard 2: Able to access information resources and possess knowledge about the way to use information search tools (average score 5.92).

However, for Standard 3: Able to analyze, evaluate, and select the information required, the average score was only 3.93, which represents the Fail level. The students in this study also achieved the Fail level in Standard 7: Have knowledge and necessary skills to use ICT in various ways (average score 3.33) (refer to Table 3).

Table 3 IL of Upper-Secondary School Students, Overall and in Each Standard n = 390

Level of information literacy	Mean	S.D.	Level
Total	31.45	5.76	Pass
Standard 1: Recognize the importance and necessity of information in learning and daily life	4.34	1.30	Pass
Standard 2: Able to access information resources and know the way to use information search tools	5.92	1.58	Fair
Standard 3: Able to analyze, evaluate, and select the information required	3.93	1.26	Fail
Standard 4: Able to collect, organize, synthesize, and use information	4.96	1.46	Moderate
Standard 5: Able to use information to produce new work and knowledge in a creative manner	4.83	1.66	Moderate
Standard 6: Possess ethics, respect the law, and display a sense of responsibility towards society on issues pertaining to information	4.15	1.64	Pass

Standard 7: Have knowledge and necessary skills to use ICT in various ways	3.33	1.20	Fail
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Problems pertaining to information literacy of upper-secondary school students

Overall, the students encountered problems concerning information literacy at a moderate level (Mean, 2.69). They faced problems in Aspect 1: Locate information from various sources, Aspect 2: Use information tools and ICT hardware and software, Aspect 3: Search for information, Aspect 4: Use information in various situations, Aspect 5: Activities supporting IL, and Aspect 6: Activities supporting ICT literacy, at a moderate level (see Table 4).

Table 4 Problems Concerning IL of Upper-Secondary School Students, Overall and in Each Aspect n = 390

Problems concerning information literacy	Mean	S.D.	Level
Overall	2.69	0.76	Moderate
Aspect 1: Locate information from various sources	2.51	0.79	Moderate
Aspect 2: Use information tools and ICT hardware & software	2.91	0.97	Moderate
Aspect 3: Search for information	2.71	0.97	Moderate
Aspect 4: Use information in various situations	2.46	0.95	Moderate
Aspect 5: Activities supporting information literacy	2.70	0.99	Moderate
Aspect 6: Activities supporting ICT literacy	2.83	1.07	Moderate

Hypotheses tests

1. Levels of information literacy and variables

The levels of overall IL were compared on the basis of the variable sex, which found that there were significant differences at the 0.001 level; female students had higher levels of IL than male students. In Standard 1 and Standard 7, it was found that no differences existed between the two groups. However, in Standard 2, 3, 4, 5, and 6, it was found that there was a significant difference at the 0.001 level.

The levels of overall IL were compared based on the variable stream of study, which revealed that a significant difference was present at the 0.05 level; students in the science-mathematics stream depicted higher levels of IL than art students. In Standard 2, 3 and 7, no significant differences were found between the two groups. However, in Standard 1, 4, 5, and 6, a significant difference was identified at the 0.05 level.

Furthermore, the levels of overall IL were compared based on the variable GPA, which demonstrated that there was a significant difference at the 0.05 level; students with different GPAs had different levels of IL. In Standard 3, no difference was found. However, in Standard 1, 2, 4, 5, 6, and 7, a significant difference was identified at the 0.05 level. The students who had GPA at the

Table 5 Results of Comparison between the Overall Level of IL, Sex, and Stream of Study

Standard	Variables	N	$\bar{X}$	S.D.	t	Sig
Overall	Sex	390	31.45	5.76	3.95	0.000***
	Male	117	29.56	6.59		
	Female	273	32.26	5.17		
Standard 3	Male	117	3.57	1.36	3.74	0.000***
	Female	273	4.08	1.18		
Standard 4	Male	117	4.62	1.61	3.06	0.002**
	Female	273	5.10	1.36		
Standard 5	Male	117	4.31	1.70	4.16	0.000***
	Female	273	5.05	1.59		
Standard 6	Male	117	3.85	1.71	2.33	0.020**
	Female	273	4.27	1.59		
Overall	Stream of study	390	5.10	1.36	3.12	0.002**
	Science-math	312	31.98	5.28		
	Art	78	29.33	7.01		
Standard 1	Science-math	312	4.41	1.28	2.30	0.022**
	Art	78	4.04	1.34		
Standard 4	Science-math	312	5.06	1.39	2.86	0.004**
	Art	78	4.54	1.62		
Standard 5	Science-math	312	4.98	1.53	3.03	0.003**
	Art	78	4.24	1.99		
Standard 6	Science-math	312	4.23	1.64	1.99	0.048*
	Art	78	3.82	1.59		

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$ **Table 6 Results of Comparison between the Overall Level of IL and GPA**

Standard	Variables	Total of variation	df	SS	MS	F	Sig
Overall	GPA	Between groups	2	1,355.39	667.70	22.71	0.000***
		Within group	387	1,549.18	29.84		
		Total	389	2,904.57			
Standard 1		Between groups	2	22.28	11.14	6.81	0.001***
		Within group	387	633.04			
		Total	389	655.32			
Standard 2		Between groups	2	26.84	13.42	5.46	0.005**
		Within group	387	950.53	2.46		
Standard 4		Between groups	2	43.73	21.86	10.84	0.000***
		Within group	387	780.53	2.02		
Standard 5		Between groups	2	72.23	36.11	13.97	0.000***
		Within group	387	1,000.60	2.59		
Standard 6		Between groups	2	37.27	18.64	7.17	0.001***
		Within group	387	1,006.10	2.60		
Standard 7		Between groups	2	18.97	9.49	6.76	0.001***
		Within group	387	543.02	1.40		

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Excellent and Good level showed higher levels of IL compared to the students who had GPA at the Fair level, with significant differences at the 0.05 level.

Subsequently, the levels of overall IL were compared based on the variable school location, which revealed that there was a significant difference at the 0.05 level; students from Narathiwat had higher levels of IL than students from Yala and Pattani. Moreover, the students from Yala had lower levels of IL than the students from Satun and Songkhla, with a significant difference at the 0.05 level.

Table 7 Results of Comparison between the Overall Level of IL and School Location

Standard	Variables	Total of variation	df	SS	MS	F	Sig
Overall	School location	Between groups	4	783.37	95.84	6.22	0.000***
		Within group	385	2,121.21	32.48		
		Total	389	12,904.57			
Standard 1		Between groups	4	31.42	7.86	4.85	0.001***
		Within group	385	623.90	1.62		
		Total	389	655.32			
Standard 2		Between groups	4	56.02	14.01	5.85	0.000***
		Within group	385	921.35	2.39		
		Total	389	977.37			
Standard 4		Between groups	4	27.97	6.99	3.38	0.010**
		Within group	385	796.29	2.07		
		Total	389	824.26			
Standard 5		Between groups	4	38.18	9.55	3.55	0.007**
		Within group	385	1,034.65	2.69		
		Total	389	1,072.83			
Standard 7		Between groups	4	14.98	3.75	2.64	0.034*
		Within group	385	547.01	1.42		
		Total	389	561.99			

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

2. Problems pertaining to information literacy and variables

With regard to problems pertaining to IL, based on the following variables: sex, stream of study, and GPA, it was found that no significant differences existed at the 0.05 level. However, a significant difference was present at the 0.001 level based on the variable school location; the students from Narathiwat faced higher level of problems concerning information literacy compared to the students from Yala. The students from Pattani had higher level of problems concerning IL than the students from Yala and Songkhla.

Opinions of and suggestions from upper-secondary school students, concerning information literacy, obtained from the open-ended section of the questionnaire

There were 54 topics of opinions and suggestions from the upper-secondary school students, and 184 frequencies were included in this section. The ten most frequent problems highlighted by students with respect to developing IL were as follows: 1) Not enough computers with internet access for students, 2) Poor

Table 8 Results of Testing Paired Groups of Overall Problems Pertaining to IL and School Location

School Location	$\bar{X}$	Differences between the Mean				
		Narathiwat	Pattani	Yala	Satun	Songkhla
Narathiwat	2.73	—	-0.11	0.30*	-0.05	0.33
Pattani	2.84		—	0.41***	0.06	0.44*
Yala	2.43			—	0.35	0.03
Satun	2.79				—	0.38
Songkhla	2.41					—

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.001$

Internet and Wi-Fi signal, 3) Limited time for internet and Wi-Fi access; books not up-to-date, 4) No earphones available, 5) No loudspeakers available, 6) Not enough books available, 7) Small libraries without enough rooms, 8) Not enough workshops conducted on new computer programs, 9) Not enough scanners; plenty of report assignments, 10) Faced difficulties searching OPAC; sufficient book exhibition not available.

Table 9 Number, Percentage, and Rank of Opinions and Suggestions on Problems Pertaining to IL

Topics of problems pertaining to IL	Frequency	Percentage	Rank
Not enough computers with internet access available for students	15	8.15	1
Poor Internet and Wi-Fi signal	14	7.60	2
Limited time for internet and Wi-Fi access	11	5.97	3
Books not up-to-date	11	5.97	3
No earphones available	10	5.43	4
No loudspeakers available	9	4.84	5
Not enough books available	8	4.34	6
Small libraries without enough rooms	7	3.80	7
Not enough workshops conducted on new computer programs	6	3.26	8
Not enough scanners	5	2.71	9
Plenty of report assignments	5	2.71	9
Difficulties operating OPAC	4	2.17	10
Sufficient book exhibition not available	4	2.17	10

Conclusion

Conclusion and discussion

The results of this study indicate that upper-secondary school students in the southernmost province of Thailand lack abilities in Standard 3: Able to analyze, evaluate, and select the information needed and in Standard 7: Possess knowledge and necessary skills to use ICT. This is similar to the findings of Foo et al. (2014) who studied IL skills in secondary schools in Singapore, arriving at the conclusion that the students needed to develop their skills to use and evaluate information.

Furthermore, studies from western countries also showed that students studying in secondary schools lacked the skills pertaining to evaluating information. Adams (1999) found that upper-secondary school students faced difficulties in evaluating information while writing science assignments, whereas Brem et al. (2001) revealed that upper-secondary school students could not decide on the reliability and correctness of websites. Brill et al. (2004) found that upper-secondary school students studying biology read science documents superficially, without thinking about them intently or analyzing their content, and Heinström (2006) found that most students tended to ascertain the relevance of information based on easy accessibility and used only superficial criteria for considering information.

The students, overall, experienced problems concerning IL at a moderate level. To elaborate, they faced problems at a moderate level in Aspect 1: Locate information from various sources, Aspect 2: Use information tools and ICT hardware and software, Aspect 3: Search for information, Aspect 5: Activities supporting IL, and Aspect 6: Activities supporting ICT literacy. The five most frequently mentioned problems pertaining to developing the students' IL were as follows: 1) Not enough computers for students, 2) Poor Internet and Wi-Fi signal, 3) Limited time for internet and Wi-Fi access; books not up-to-date, 4) No earphones available, and 5) No loudspeakers available. Clearly, the problems most frequently identified by students with respect to developing IL concerned technological equipment, showing that the students were alert to the advantages of technology, had positive attitudes, and wanted to use it. According to Parang, Raine, and Stevenson (2000), IL involved the integration of several concepts, such as library literacy, computer literacy, media literacy, information ethics, critical thinking, and communication skills, and IL is closely related to information technology skills. This is relevant to the findings of the students' level of IL in Standard 7, which denotes that the students lacked enough knowledge and necessary skills to use ICT. Thus, it is a good opportunity for teachers and librarians to provide activities and facilities concerning ICT.

In conclusion, this research's findings presented interesting results, which ascertained that sex, GPA, stream of study, and school location play important roles in IL. This is relevant to Martin's (2011) study, which found demographics influencing student learning outcomes, and Foo et al.'s (2014) study, which indicated that types of school and academic stream of study seemed to have significant influences on IL. Harrison and Newton's (2010) research concluded that a strong relationship existed between the performance on the IL skills and students' academic performance throughout their degree program. With regard to the GPA and stream of study hypothesis, a positive relation between intelligence and information literacy was confirmed by many studies (Cameron et al., 2007;

Glendale Community College, 2007; Katz et al., 2008). Intelligence or cognitive ability was considered to be the most important indicator of academic success (Jensen, 1998; Kuncel et al., 2001; Mayer, 2011).

Moreover, this present study found that only school location had an impact on problems pertaining to IL. Obviously, schools located in urban areas seemed to have few problems compared to schools in rural areas. However, this subject requires further in-depth research to identify the differences of each school that impact students' IL development.

Implications

Based on the results of this study, the researchers propose that teaching and learning activities should be redesigned using collaborative teaching methods to enhance students' IL. The model of collaboration should include teachers who are responsible for discussing the topic or content of knowledge, librarians who provide learning materials from inside and outside the libraries, computer personnel who provide hardware and software for students' presentation. All the involved people, teachers; librarians; and computer personnel should take part in evaluating upper-secondary school students' learning process. The information science literature clearly demonstrates that collaborative efforts between librarians and academics lead to better results in students' acquisition of literacy skills (Boff & Johnson, 2002; Cunningham & Lanning, 2002; Korobili, Maliari, & Christodoulou, 2008). Additionally, the Educational Supervisory Unit and upper-secondary school administrators should set guidelines and standards for providing modern ICT equipment to students, which they can use in classrooms, libraries, and computer rooms. These implications would help improve the students' abilities to evaluate information as well as obtain knowledge and necessary skills to use ICT.

Moreover, more activities and programs on IL should be provided to students studying arts, male students, students who had GPA at Fair level, and schools located in Narathiwat and Pattani.

Further studies

The researchers also suggest that further studies need to be conducted with the aim of enhancing the IL of upper-secondary school students in the southernmost provinces of Thailand, while focusing on the issues concerning activities/games to support each of the seven standards of IL and promote awareness of the importance of IL among students as well as teachers. In addition, more studies on library management, librarians' roles, and technology in libraries and computer rooms in schools need to be conducted. Lastly, the learning and teaching process needs to be explored and investigated further in order to promote effective student IL.

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Appendix

I. Sample items of the test (Standard I, item1–8; Standard II, item 9–16; Standard III, item 17–24)

Direction: Please tick the correct answer by marking ✓ on the letter in each question.

1. Which option is correct about “information”?
 - A. Information is important for students
 - B. Information is for administrators
 - C. Information is for researchers
 - D. Information is for everyone
2. Which option states the correct objective of information usage?
 - A. For news and information
 - B. For recreation
 - C. For studies and research
 - D. All of them
3. Which option is correct about using information?
 - A. Use information from the Internet, because it is free.
 - B. Use information from newspaper, because it is reliable.
 - C. Use information from the library, because it provides systematic services.
 - D. Use information from people who live in villages, because it is free.
4. If students want to search for up-to-date information pertaining to a research report, which is the best source among the options given below?
 - A. Magazine
 - B. Academic journal
 - C. Dictionary
 - D. Book
5. Students can use and search for information free of cost from which of the following?
 - A. Public library
 - B. Internet café/shop
 - C. Academic library
 - D. Corporate information center
6. Which option shows that a person is aware of the importance of information concerning taking care of one’s health?
 - A. Always reading the newspaper “Kom Chad Luek”
 - B. Always reading the magazine “Chivajit”
 - C. Always reading “Sally’s Happiness”
 - D. Always following “Suthichai” on Twitter
7. Which answer represents important sources of information in Southern Border Provinces?
 - A. Thonchang Waterfall, Yarang Ancient City, Baetong Centre, and Tarutuan Island
 - B. Arawan Waterfall, Chiya Ancient City, Baetong Centre, and Tarutuan Island
 - C. Samela cape, Saerung Waterfall, Ancient City, Baetong Centre, and Tarutuan Island
 - D. Thonchang Waterfall, Saithong Castle, Baetong centre, Khoyo Island, and Prataad Temple

8. Which is the correct scope of a study on “Internet usage for education”?
- A. Internet
B. Internet and education
C. Education
D. Education and technology
9. If you want to retrieve information from the OPAC, you should start searching which of the following options?
- A. Author and publisher
B. Author and keyword
C. Author and year
D. Author and place of printing
10. If you want to search for information about “Dangerous things on the Internet for Thai teenagers”, which is the best search term to acquire specific information?
- A. Dangerous
B. Thai teenager
C. Information and teenager
D. Internet and Thai teenager
11. Which program does not require the Internet?
- A. Internet Explorer
B. Yahoo
C. Google
D. PowerPoint
12. Search Engine is a tool for searching which of the following?
- A. CD-ROM information
B. Books from libraries
C. WWW
D. Interlibrary loan
13. Which of the following is a tool used to search for information on the Internet?
- A. Altavista
B. Yahoo
C. Google
D. All of them
14. Which option includes the most suitable places for conducting a report on “multi-culture”?
- A. Narathat Beach, Samila Beach, and Central Mosque
B. Big C, Lotus, and Sirorot Market
C. Mont Tanguay, Koh Lipe Island, and Limgonael
D. Central Mosque, Changhai Temple, and Limtokiem Shrine
15. Which is the best source to find information about organic agriculture?
- A. Owner of organic agriculture shop
B. Vegetable seller
C. Organic agriculture consumer
D. Awarded organic agriculturist
16. Aminoh wants to write a report about “How to make fish sauce”, which is an OTOP product of the community. Who is the best source for her to acquire information?
- A. Mrs. Fatimah, Head of the OTOP product
B. Mr. Maeae, Fish specialist
C. Miss Wana, Food specialist
D. Dr. Wichai, Health specialist

From the following extract of a news piece, please answer question 17 and 18:

The new epidemic disease spreads from person to person; some sources said, “students need to wear tiny nanotechnology products, costing 2,000 baht, in order to be safe”.

17. Which of the following is the correct conclusion?
- A. There is a new epidemic disease.
 - B. Nanotechnology is expensive.
 - C. Students need to wear nanotechnology products.
 - D. Many people have died.
18. Students can check the reliability of information from which of the following options?
- A. Friend
 - B. Health specialist
 - C. Teacher
 - D. Police
19. Which website URL is suitable for citations?
- A. .com
 - B. .org
 - C. .edu
 - D. .net
20. If you receive information from an email, you should do which of the following?
- A. Check for reliability
 - B. Forward it to your friend
 - C. Use it immediately
 - D. Find the sender
21. Why do you have to evaluate information obtained from the World Wide Web (WWW)?
- A. The information is complicated.
 - B. The information is not relevant to what you want.
 - C. The information is not checked by experts, whether it is correct or not.
 - D. The information is not up-to-date.
22. Information obtained from searching the Prince of Songkla University's website (www.psu.ac.th) is reliable, because of which of the following options?
- A. It is created by an educational institution.
 - B. It is recognized by people around the world.
 - C. Many people use it.
 - D. No correct answer.
23. Information from the website shoponline.com is reliable because of which of the following options?
- A. It is created by an educational institution.
 - B. It is recognized by people around the world.
 - C. Many people use it.
 - D. No correct answer.
24. Which of the following criteria is used for evaluating information gathered from a book?
- A. Price
 - B. Author's expertise
 - C. Illustration
 - D. Author's age

II. Samples of questionnaire on problems concerning information literacy

Instruction: Please put a tick mark (✓) beside specific levels of problems pertaining to information literacy, which you encounter.

Level 1 indicates problems are very low
 Level 2 indicates problems are low
 Level 3 indicates problems are moderate
 Level 4 indicates problems are high
 Level 5 indicates problems are very high

1. Levels of problems pertaining to locating information from various sources

Topic	Level of problems					Add more information if needed
	1	2	3	4	5	
1.1 Printed materials: books, journals, newspapers, etc.						
1.2 Electronic materials: e-book, e-journal, e-newspaper, website, etc.						
1.3 Social media platforms: Facebook, YouTube, etc.						
1.4 Audio-Visual materials, etc.						
1.5 People: librarians, teachers, friends						
1.6 Other (please specify).....						

2. Levels of problems pertaining to using information tools and ICT hardware & software

Topic	Level of problems					Add more information if needed
	1	2	3	4	5	
1.1 Software						
1.2 Computers						
1.3 Internet access						
1.4 Printers						
1.5 Scanners						
1.6 Other (please specify)						



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JoEMLS 註釋(Notes)暨參考文獻(References)

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2015年1月31日修訂

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6. 羅馬化範例：

範例1－註釋(Notes)

林信成、陳瑩潔、游忠諺，「Wiki協作系統應用於數位典藏之內容加值與知識匯集」，教育資料與圖書館學 43 卷，3 期(2006)：285-307。【Sinn-Cheng Lin, Ying-Chieh Chen, and Chung-Yen Yu, “Application of Wiki Collaboration System for Value Adding and Knowledge Aggregation in a Digital Archive Project,” *Journal of Educational Media & Library Sciences* 43, no. 3 (2006): 285-307. (in Chinese)】

範例2－參考文獻(References)

林雯瑤、邱炯友(2012)。教育資料與圖書館學四十年之書目計量分析。教育資料與圖書館學，49(3)，297-314。【Lin, Wen-Yau Cathy, & Chiu, Jeong-Yeou (2012) A bibliometric study of the *Journal of Educational Media & Library Sciences*, 1970-2010. *Journal of Educational Media & Library Sciences*, 49(3), 297-314. (in Chinese)】

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